DOMESTIC ENGINEERING

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Suggestion:
Cut out; frame neatly; put in show window; change weekly.

VACUUM HEATING.

The keen householder, realizing the desirability of reducing his fuel bill for house heating by 25 per cent, will carefully consider the subject of installing vacuum heating on a new job, or of altering to vacuum if the system is fitted with ordinary air valves. In addition to the fuel saving, important in itself, the vacuum system of heating permits a range of temperatures in steam heretofore possible only in water heating, meaning increased comfort.

Borrowing Money for Business Purposes

Every business enterprise requires capital for its successful operation. If a certain amount of capital is engaged in an active business, it may be assumed that it will decrease if the business is not successful, or increase if it is. In a successful business a constantly increasing amount of capital is being locked up in various departments. Stock on hand increases even against the manager's wishes; accounts owed a growing business by outside persons or firms constantly increase in volume; tools and equipment consume a constantly growing volume of capital. The business man who carefully keeps track of these movements of his capital observes, sometimes with chagrin, that while his resources are satisfactorily growing, he is hampered by having them in slow moving form where he is unable to make quick use of them.

* * *

Occasionally it is very desirable to have ready capital for a quick turn. Less than formerly, however, is it profitable to speculate on the market in pipe, fittings, pig lead or iron, or in copper. I well remember the reputation a certain lead products manufacturer had in years gone by, of making more money in speculation in pig lead than he did on his manufacturing business. It is still fresh in memory how a great manufacturing jobber, who is gifted with prescience in market values beyond most living men, made many thousands of dollars by purchasing pipe before a phenomenal rise. Not again, probably, will we see such rapidly fluctuating selling prices in plumbing and heating goods as were formerly common enough. Two reasons are responsible for this change. One is the more rapid and increased production and distribution of products; the other is the more general control of large organizations of capital which has a tendency to equalize prices and keep them more nearly parallel with costs of production. Still another reason may be the less common preference in prices to certain specially favored buyers. Still, in spite of different market conditions, it is yet possible for a business man to avail himself of certain advantageous conditions if he has the ready money to carry out an unusual transaction.

* * *

The ability to put one's self in this position exists if good credit is enjoyed,—credit with reliable and conservative bankers. With a business on a firm basis this is readily obtained. Its advantages are obvious. With credit at a bank where money can be borrowed on notes at 5½ or 6 per cent per annum, invoices for merchandise can be discounted at 2 or 3 per cent if paid in ten days. This is a fine piece of good financing. Again, a dealer, short of cash but long in goods, will

frequently quote especially attractive prices for a cash transaction. This permits an abnormally large profit if the purchaser does not foolishly give up his advantage in quoting lower prices than his competitor on the fortunate purchase. Again, if in the conduct of a business a clean net profit of ten per cent is made, and there is $5,000 capital in the business, and this capital is turned over ten times a year, that is, a business of $50,000 a year is done, the profit is $5,000 a year. If this business man could, by doubling his capital, take twice as many or twice as large contracts, handle twice as much labor and material to as good advantage, it is plainly evident that his annual business would be $100,000 and his profit $10,000. If his credit is good enough to borrow that necessary $5,000 at 6 per cent per annum, its use will cost him $300 and his net gain will be $4,700. This simple illustration of the advantageous use of credit should be an encouragement to the ambitious man who is confident of his trading ability.

* * *

Whether a basis for credit exists in a business is a simple matter of demonstration . Should you go to a bank seeking credit, you would be asked to give certain information necessary to base their judgment upon as to the safety of your business. This information might be something like the following:

Assets—

Cash on hand
Cash in bank
Open accounts due from Customers, Good
Notes due from Customers, Good, $ Less notes discounted or sold , $
Merchandise, finished and unfinished $
Raw material, $
Listed Stocks and Bonds, $
Accounts and Notes Due, Doubtful, $
Accounts and Notes due from Partners, $
Unlisted Stocks and Bonds, $
Plant, Buildings, $, Ground $
Real Estate (other than plant) belonging to firm, $
Machinery and Fixtures, $
Horses, Wagons, etc., $
Good Will, Patterns, Patents, etc., $
Other assets, and of what composed, $
Invested in Business
Partner's Outside Means
Total

(Specify any of above liabilities secured by collateral.)

Liabilities—

Open Accounts payable for Mdse., Not Due, $
Open Accounts payable for Mdse., Past Due, $
Notes payable for Mdse., not due and not renewed, $
Notes payable for Mdse., past due or renewed, $
Notes payable to this Bank, $
Notes payable to other Banks, $
Notes payable for (other) borrowed money, $
Open Accounts payable for borrowed money, $
Accounts and Notes due Partners, $
Mortgages or Liens on Real Estate $
Chattel Mortgages, $
Other indebtedness, and of what composed, $
Total Liabilites, $
Net Worth, $
Total

(Specify any of above laibilities secured by collateral.)

Contingent Liability: Accommodation endorsements For Bonds or Sureties Accounts receivable, discounted, assigned or sold For Guarantees For Insurance on Mdse., $, On Buildings, $ On Machinery and Tools, $, Credit Insurance Carried, $, Life Insurance payable to firm, $, Amount charged off for bad debts last year, $ Co-partnership dates from , Expires when Sales, last months, $, Expenses for that period, $, Profits for that period, $, Profits last three consecutive years, 19 $, 19 $, $ 19 $, Amount charged off against plant 19 , $, 19 , $ 19 , $, At what time in year are liabilities the heaviest ? When the lightest ? Average terms of sales . Average terms of purchases . Is statement estimated or from actual inventory ? Regular time of taking inventory Original capital paid in, $. In cash $. In other property, $.

* * *

From the figures given in response to this inquiry the banker is enabled to estimate what your "quick assets" are, that is, those resources which, in an emergency could be quickly turned into money, and on this element of your business he will, in all probability, base his willingness to loan money.

It may be desirable some day to know what your borrowing power is. If you take the foregoing questions as a guide and make up a statement of your business and take it to a banker asking him how much money you can borrow, you may be pleasantly surprised, or you may be disappointed, but in any case, if you have done it, you will be instructed.

Jno. K. Allen.

Her Feat.

"There is one thing which only a popular girl can achieve."

"What is that?"

"Being at the same time a miss and a hit."—Baltimore American.

Oh! Thank You.

Recently an automobilist ran down and killed a hen. He was, says the New York Times, a conscientious automobilist. Instead of racing along, unmindful of the grief of the owners of that hen, he immediately stopped, got out, tenderly picked up the unfortunate fowl, and rang the doorbell of the farmhouse, from the vicinity of which it had emerged. A woman opened the door. "I am very sorry to inform you," remarked the automobilist, "that I have unintentionally killed this hen of yours." He held the fowl up to her view. "Now, I am quite willing to pay whatever the value—" But she checked him with this joyous exclamation:

"Oh, I'm so much obliged to you. I've been trying to catch that hen for three days to cook it for dinner, and I never could so much as lay a hand on the pesky thing. Thank you, sir, thank you."

Some Heating Questions—II*

PRACTICAL HINTS ON GETTING AT AND CONSTRUCTING THE JOB.

By CHARLES B. STARKEY.

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I presume that ere long arrangements may be perfected by which one can simply stand to one side and throw the pipe at the job and see it stick. Now I saw a statement some time ago that the journeyman steam fitter should not be troubled with the delivery of radiators. I also read that no work should be started on the job until the material had arrived. I want to state right here that there is not one shop in ten that does things in that way, nor is it necessary, if the master or foreman has his wits about him. There are many conditions which would render the latter proposition extremely inconvenient. For instance, on large buildings many times the mains and branches must be run several weeks (and sometimes months) before it is necessary to place the boilers or radiators, and they would be directly in the way of everybody, or else piled up on a corner of the lot to rust and cause extra cost for the removal of dirt and rust which always accumulate.

The man who can not run the mains and get them right without having to start at the boiler, simply is not a steamfitter. He is merely a pretender who will be discovered and quickly "fired" by any boss worthy of the name. Likewise in placing the "stubs" for radiator connections. One knows the sizes of the valves and the tapping and height of the radiators where the connection is to be made. It is not necessary to have a radiator within ten miles in order to get this part of the work in correctly. The catalogue will give the "roughing-in" measurements for all, and the fitter who cannot figure this out and get his work in right should not be allowed to hold the name. A good helper of a couple of years' (or less) experience ought to be able to do this simple task.

As to the fitter having charge of handling the radiators the writer has always preferred to attend to this matter for himself, for the reason that he knew where each radiator should go on the job. The driver, teamster, or delivery company does not care where the radiators are placed so long as they are once inside the walls of the building. It is all the same to them, and the radiators once delivered, it will be found many times that half of the number are in the wrong place and must be changed. So the fitter must stop his work then and attend to the matter. This causes four losses. First, the handling of a part of the radiators the second time. Second, this has already been paid for once. Third, the cost of fitter's time while so doing, and also the loss of time on that part of the work he was doing when he was called off to replace the radiators. On a job that can be completed before the fitter moves the tools away, it is, of course, a mighty fine thing to have the complete material, valves, radiators, boiler, etc., on the job before the work starts, but in actual practice this does not always happen for many reasons which all shop men and fitters are well aware of. The shipment may be delayed, the weather inclement, roads too bad to haul a heavy load, the building unfinished, the space limited; these are some of the things which might prevent the complete delivery of the goods. It is here that both master and fitter show their sense and mettle by adjusting themselves to the circumstances of the occasion and working to the best advantage possible, according to the exact situation.

The master or foreman should insist that as much work as is possible should be done at the bench. This saves time and miles of walking on the part of the fitter and helper. The journeyman is not supposed to be drawing pay as a pedestrian, but he gets good money for being a fitter. Insist that he earn it, or else look for another job.

Any good fitter should be able to take from three to six measurements and upon proper occasions cut up the entire main line before the first piece is slung in the hangers, which should be permanently placed, if they can be obtained. The use of temporary hangers causes direct loss, and they should be avoided whenever it is possible.

The fitter and helper should be kept busy. Some fitters have the faculty of being able to look ahead and watch out on this point, but many do not, and for these the foreman or master must think. It is a case of knowing your men. The right kind of a system should be installed in the proper building. Many times, with the best material and workmanship, the job fails to

*The first article of this series was published in our issue of December 4, 1909.

give satisfaction. And this can be attributed to the man who laid out the system, and perhaps had an overhead system installed where a divided circuit system would have worked to better advantage, or perchance a hot water system would have been the very best system of all for that place. It may, perhaps, cost a few dollars more to adjust the radiators to the place where they are to set. Today manufacturers are turning out so many different forms of radiators that it is difficult to find a place where one fails to fit.

Do not put a 3-column, 38-inch radiator where wall radiation, or an indirect is needed in order to save a few dollars. If you can't get the job at profit enough to do it right, let someone else do it, but when putting the work in, make the radiators harmonize with the surroundings as far as you can, and get proper service from the plant, and bear it in mind that the least conspicuous they can be in the room, the better everybody around the house will be satisfied, as a general proposition. The job should be installed in the simplest manner consistent with its working properly. The shorter the distance between boiler and radiator, the quicker the steam will get to its place of duty. One matter which is an endless source of dissatisfaction is uncompleted jobs, such as a plant put in and the mains left uncovered, or the radiators unbronzed for weeks after the heat is started.

In the rush of the season it is not always possible to complete the job entirely, but whenever it can be done it should be, both for the benefit of the master and the customer.

Many times the customer is putting up a kick on the job simply because he (or she)does not know how to manage it to the best advantage. Some masters are so careless of their own best interests that they fail to give the customer any instructions whatever on this point. A set of printed instructions (which, by the way, comes with the boiler), should be nailed to some post or wall of the cellar. It pays big to scatter some information about the workings of the plant, and have a walking satisfied advertisement in that section in the shape of a satisfied customer, who can demonstrate the workings of a first-class heating plant installed "O. K."

"Where the Snow Flies." Up at Cattaraugus, N. Y., this picture was made and it shows the two members of the Century Brass Manufacturing Company, of that place, fearlessly braving a blizzard.—From photograph by our Mr. E. De Forest Winslow.

Public Baths in School House Basements*

By Reuben S. Bemis
Inspector of Plumbing, Providence, R. I. Member A. S. I. P. & S. E.

The majority of American cities undoubtedly are interested in the question of free public baths. Bathhouses for the use of those who have no bathing facilities in their own homes probably would be provided in about every large center of population but for the expense. Land, buildings and plumbing are costly, and there are so many pressing demands for pavements, sewers, water mains, fire department equipment, school houses and police service that taxpayers naturally object to any additional burden and City Councils, therefore, hesitate to appropriate money for public baths, notwithstanding general belief in their desirability and practical value.

The public bath question has been discussed for some time in Providence, and as in many other cities, no progress has been made because of the large appropriation required. It recently occurred to the Inspector of Plumbing in Providence that parts of existing buildings might be utilized for

*Read at the fourth annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, held in Omaha, Nebr., on February 8-10, 1909.

public baths and thus save the city the cost of land and specially designed buildings. The City Council was requested to make inquiry as to the practicability of locating shower baths in the basements of some of the school houses located in districts where free baths are particularly needed.

This plan, the Inspector believes, is more than a mere makeshift, but it is not expected to prove a complete solution of the bath problem; it is intended only as a valuable auxiliary and to meet in part the needs of the public until the city is able to provide bath houses of ample size and modern construction.

This proposition has the merit of simplicity and calls for an outlay which may be considered nominal in view of the results to be attained. Not a cent need be appropriated for land or buildings; the city now owns the school houses, which are provided with water and sewer connections and steam apparatus, which may be used for heating water for the shower baths.

The schools are closed during July and August, the months in which baths would be most grateful to the laboring population. Only the basement doors need be opened; the upper floors should be closed to the public. There is ample room for partitions separating the showers; drainage is easily obtained and of course water connections cost practically nothing. Bathers can use their own towels and thus eliminate the expense of a laundry, and the attendants can be the regular school janitors, who need no instruction in the operation of its steam plants employed for heating water.

Under proper regulations these baths could be opened evenings throughout the entire year, use in the daytime being permitted only in July and August.

Estimates of cost, I am confident, will show that good bathing facilities can be had at moderate expenditure for equipment and minimum expense for maintenance. Therefore, it is recommended that the City Councils designate a school building in a locality where home bathrooms are lacking to be supplied with shower baths for the public. One season would demonstrate the practicability of the plan outlined and enable the city to decide whether or not other buildings in the tenement districts should be utilized as bath houses until a more elaborate system can be adopted.

Shower baths in many schools are reserved for pupils, and their effectiveness in encouraging cleanliness among children has been proved.

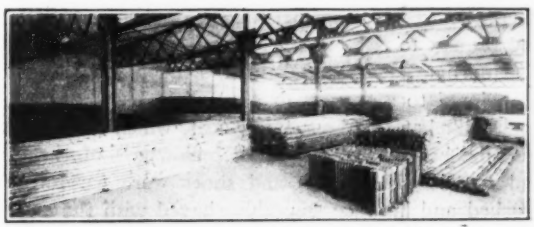
"Baths before books" is a maxim of Dr. W. H. Maxwell, City Superintendent of Schools of New York City. This eminent educator, in an address delivered a few weeks since at the American Museum of Natural History before the Playground Association of America, declared that the usefulness to the city in point of morality of the Carnegie public libraries was small compared with that which would accrue from a comprehensive system of public baths.

"As I draw books myself from a Carnegie library and watch the children of the public schools go there for reading matter," said he, "I bless the great iron master for what he has done for the intellectual improvement and recreation of this city, and yet the usefulness from a moral and hygienic point of view of the Carnegie libraries is small compared with the advantages that would flow from the benevolence of him who shall increase the number of public school baths.

"I know of no better way for philanthropists to promote the physical and moral welfare of the rising generation, their health, cleanliness and comfort, than by placing, say $250,000, at the disposal of the Board of Education for the construction of shower baths in all our school buildings in the poorer neighborhoods."

The benefits of shower baths to the rising generation are unquestioned, as Dr. Maxwell says, but why limit them to children? Should not the parents also draw some benefit from the costly school buildings for which they are taxed directly or indirectly? The installation of shower baths in the basements will be as beneficial to adults as the baths now used by the pupils, and if adopted Providence will have the credit of being one of the first, if not the first, to make the most comprehensive use of school buildings for the betterment of its residents.

I am convinced that the bath house plan, as briefly outlined, is of general interest, and that every city which looks into it carefully will find that free baths can be furnished thousands of persons without injury to school buildings or any appreciable increase of expenditure.



Picture of basement from new Portland, Oregon, branch of Crane Company, showing storage of piping, radiation, etc.

Trying the Trick on Kelly

BY EDWIN DROOD.

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"If there is an all-wise Providence which tempers the wind to the shorn lamb, surely," remarked Kelly, reflectively, "there must be a Divine Power, which watches over the affairs of young business men, to keep them from being wrecked by the sharpers and dead beats who deluge them with their patronage. Was there ever a plumber started in business, I wonder, whose hopes were not raised high by the rush of business to his shop, until, by sad experience, he learned that the tide had set in his direction because it was damned at other shops by accumulation of unpaid bills? If so, his experience was different from mine, for I ran the usual course of dead beats, grafters and sharpers, like a child having measles, whooping cough, and the mumps, before I finally got my bearings and was able to steer my frail bark in a more prosperous direction."

"I can hardly think of your being picked out as an easy one," remarked the drummer by way of drawing out the story he knew was coming. "Who was the first one to try it on you?"

"You might not believe it," replied Kelly, settling himself comfortably in his chair, and taking on a reminiscent mood, "but the paint was not dry on that sign there, before I was flattered by a call from a man who wanted me to do his work. I say I was flattered, and I was, because Alex. MacDonald was a man of no small consequence at that time, while I had not my present knowledge of human nature, and did not know that a person could resort to all kinds of sharp tricks and practices in business without losing his character and standing in society.

"I was standing by the window that morning, watching the truckman move the safe into its present corner, when the door opened and in walked Alex. Up to that time I had known him only by reputation, as a deacon of the church, superintendent of Sunday School, a stanch Christian and prompt to pay his bills. As I looked him over this morning, I saw a tall man, slender and stoop-shouldered to a degree, dressed all in black, wearing a silk hat and long frock coat, which accentuated the height and unnatural hollowness of chest and torso. His clothes and shoes were carefully brushed and his face smoothly shaved with the exception of his chin, which grew a round bunch of grey whiskers, very like a tuft of dead grass on a swamp bog. His eyes were close and narrow, so that their depths could not be seen to read what was passing in his mind. His nose was long, prominent and hooked, with narrow slits of nostrils, and his mouth was a straight line with the lips pressed tight together like the straight jaws of a vise. This morning he held a hymn-book in his hand, and carried a roll of blue prints under his arm.

"'Good morning, Mr. Kelly,' he said patronizingly, extending a clam for me to shake. 'Just starting in business, I see,' he purred, looking around the shop. 'That is why I called,' and he laid the roll of blue prints on my flat-top desk. 'I believe in helping the young and ambitious, who are just starting in life,' he continued, allowing the corners of his mouth to curl up a little, 'for I was young once myself,' and he beamed on me in a benign way.

"'What can I do for you, Mr. MacDonald?' I replied in my most cordial manner. 'If you are in the market for any plumbing or heating I know I can give you satisfaction, and save you money.'

"You see, I played two of my trump cards on that trick. While he had the reputation of paying his bills, he likewise was noted for being hard to please and close as the bark on a young birch tree in driving a bargain; so I thought he had swallowed my bait, hook and all, when he replied, 'That's just it; a young fellow starting in business is anxious to establish himself and is therefore bound to please, while as he has no business reputation, of course he will be willing to do the work for less than his established competitors,' and he favored me with a view of his store teeth, in what I was unable to make out was a smile or a snarl. 'But,' he continued, 'when I saw by your window-sign that the son of my old friend had started in business, I concluded to give him a lift, for his father's sake, just as I would like my boys to be helped if I were dead,' and the hymn-book somehow or other came into my range of vision. 'What is it the Good Book says?' he asked, casting his eyes reverently to the ceiling. 'Why, do unto others as you would have them do unto you, and that is a good rule, too, for guidance through life,' and he softly whistled a few bars from the Doxology. Somehow, that hymn-book, the tune, and his sanctimonious manner got into my blood, and I stood awaiting further developments, for I now felt satisfied that he was going to give me my first boost in business, and I felt so grateful for his kindness, that I could not think of anything to say. Of course, it was his Christian spirit which was actuating him, and I would have taken his word for

anything, as I listened to the closing notes he was whistling.

"'I am sorry,' said Alex., coming back to business, 'that I didn't know sooner you were about to engage in business. I let the plumbing in my new apartment house only yesterday, but, thank fortune, the heating has not yet been given out, and if you can do it as cheap as anyone else, I want you to do the work. Of course you understand'—and there was a trap-like click of his teeth—'that there can be no preference in price. If you will do the work for the amount of the lowest bid I have, I'll give you the contract.'

"'There are the plans for the building,' he said, indicating the blue prints, 'and here is the specification,' handing me a roll of typewritten manuscript. 'And now, when can I have your figures?'

"'Tomorrow at this time, if that will do,' I replied.

"'Tomorrow at this time it is, then,' and he started for the street. 'You understand,' he said, pausing near the door, and looking back, that the work everybody figured on was the two-pipe throughout, with wet returns and all riser connections valved. The rest you will get from the specifications,' and the door closed on his departing form.

"I sat late into the night, pouring over the plans and specifications, consulting list prices and discounts, and going over my figures to check up and make sure I had made no mistake, and when finally I wearily laid the work to one side, I made out that without adding profit or operating expenses, the work would net me three thousand dollars. As I had never been in business before, I was at a loss what amount to allow for operating expenses, but finally decided on 10 per cent as a fair allowance and adding 10 per cent also for profit, brought my estimate to three thousand six hundred and thirty dollars. I remember the amount perfectly, for I had occasion later to bear it in mind.

"In going over the plans, I found they were prepared by a well-known firm of contracting engineers. The plans showed the location and size of boiler and location of radiators, but from all appearances indicated the one-pipe system of heating, with dry returns. Further, the sizes of radiators had originally been marked, but the ratings were all crossed off. The specifications which went with the plans, however, appeared to clear up every discrepancy, except one. Both the plans and specifications called for a boiler of a certain capacity, which corresponded with the original markings of the radiators on the plans; but the specifications called for a great deal more radiation than the plans, and far more than could be supplied by the boiler, even with the mains covered. This discrepancy I made a mental note of, then rolled in for the night, tired but well satisfied with my day's work.

"The next morning MacDonald came bustling into the office, as though chock full of business, and no time to waste.

"'Well,' he inquired, 'how much do you make the work out to cost?'

"'Mr. MacDonald,' I replied, with my most business-like air, 'I'll put you in a first class job, according to your plans and specifications, for thirty-six hundred dollars.'

"'Why, man dear,' he said in pitying tone, 'you're high, way high. I can get the work done for three thousand dollars.'

"'If you can,' I returned, 'and by a reliable contractor, you had better accept the offer. It would cost me more than that amount to do the work.'

"'Not so fast,' he replied smoothly, 'I started in this to help you for your dear father's sake, and I'm going to do so if possible. It will mean a great deal to you, outside of profit, to get this job, for it will give you a standing, with someone to refer to; and I mean to recommend you to all my friends. Why, in view of the benefits you will derive from doing this work, you could well afford to do it without profit. But you won't have to. Follow my advice and make the material people pay your profit. How? Why, just this way. If other people can do this work for three thousand dollars, so could you, if the dealers were not charging you more than they do your competitors. Because you are young in the business and have no work on hand, they are quoting you higher prices. Once

Illustration from new Portland branch of Crane Company, showing care of sinks, valves, and other goods in stock.

you get some work just see how they come down. Then, having the best prices, you can figure more successfully on other work. Besides, not having any experience, you are probably figuring high on labor, and by taking this job you will learn just what you can do work for. Here is my lowest estimate,' and he laid down a formal bid from the firm of contracting engineers that prepared the plans.

"Certainly he could not have played his cards better. If they could do the work for three thousand dollars, why couldn't I? Besides, as he said, I needed a job to get a line on what I could do, and as a card to refer people to. But at that moment a thought struck me. 'Mr. MacDonald,' I asked, 'is that estimate for a one-pipe or a two-pipe system?'

"'Two-pipe,' he answered unhesitatingly. 'Figured from the plans and specifications that you estimated from.'

"'One thing more,' I said, 'before I give my decision. In going over the plans, I find that the boiler is not of sufficient capacity to supply the amount of radiation called for. Don't you think I had better estimate on a larger one?'

"'Mr. Kelly,' he replied, 'these plans were prepared by a firm of the best heating engineers in the city, and they know their business. You will figure on the boiler, just as it is called for.'

"'Very well, then,' I answered, closing my eyes, and taking a leap in the dark, 'I'll do the job for three thousand dollars. But, as I have nothing to say about proportioning the apparatus, I will not accept any responsibility for its successful operation. My contract ends when I install the work according to the plans and specifications. Is that satisfactory?'

"MacDonald stood rubbing his hands together, a perfect picture of greedy satisfaction. 'That will be perfectly satisfactory, Mr. Kelly,' he replied.

"'Very well, then, I will have my lawyer prepare a contract and tomorrow we can sign it.' Right there you will see is where I made a wise move and one I have consistently followed out in practice since. I find it much better to pay a lawyer five dollars to prepare a contract for me than to pay him several hundred in trying to win a suit on one I have made. That evening I went to a lawyer friend of mine, explained the circumstances fully, and he prepared an indenture, which protected me fully from any defects in design, and next morning the papers were duly signed.

"A few days later, I went out to the building to look it over. There I met a representative of the steam heating concern that prepared the plans, who was waiting around for a chance to see MacDonald. 'Hello, Kelly,' he sang out, when he saw me, 'what you doing here?'

"'Got the contract to heat the building with steam,' I answered, a little elated with my success.

"'You don't say,' he replied, slightly nettled. 'I thought I was going to land the job. Well it's all in a life-time,' he went on resignedly. 'I thought our bid of three thousand for the one-pipe or thirty-six hundred for the two-pipe system about bed rock. But you must have been lower or old tight-skin could never have given you the work. Well, I wish you success,' and he started to move away.

"But a light, a great light, had dawned upon me while he was speaking, and now I was hungry for more information, so I joined him and together we walked away from the building.

"'There is one thing,' I said tentatively, 'that I don't understand. Alex. was showing me a set of plans yesterday, prepared by your firm, but there is only a 2,400 foot boiler to carry 3000 feet of radiation. How do you explain that?'

"'Easiest thing in the world,' he returned. 'At his request, we prepared a plan for a 2,400 foot one-pipe job of heating, and gave him an estimate of three thousand dollars for the work. Then we pointed out that there was insufficient radiation in the rooms to keep them warm and had the rating increased to three thousand feet. Then he wanted the two-pipe system, which we offered to install for thirty-six hundred dollars. That was the estimate I was up to learn the fate of when I met you. We didn't change the size of boiler or radiators on the plans, but just mentioned it in our estimate.'

"'Is this the specification you were to do the work according to?' I asked, showing him my set.

"He looked them over carefully, then returned them to me with the remark, 'Almost identically the same, but in copying them, whoever did so made a mistake in the boiler and specified the one we had estimated for the first, the three thousand dollar job.'

"It was a bitter, a humiliating pill, but it had to be swallowed. I had been stung, tricked into taking a job for much less than it was worth and at a losing price. I was a fool, a dunder-head, but I had learned my lesson and would never again take work at another man's figures, when they were below mine.

"Back to the lawyer I went to see if I could not get out of the contract, but there was no encouragement along that line, so I told him the way I had been trapped.

"'Huh! sort of sharp practice, I would say,' he mumbled meditatively, when I had told my story,

'but as it is a case of dog eat dog, why don't you go for him. You can beat him out yet, if you have the backbone,' and his eyes blazed with the fire of conflict.

"'Backbone, is it?' I flashed back, 'just you show me how I can do the trick and I'll show you if I'm lacking in backbone.'

"Well, I stayed there a couple of hours, talking the matter over, and when I left for home, our plans were all made.

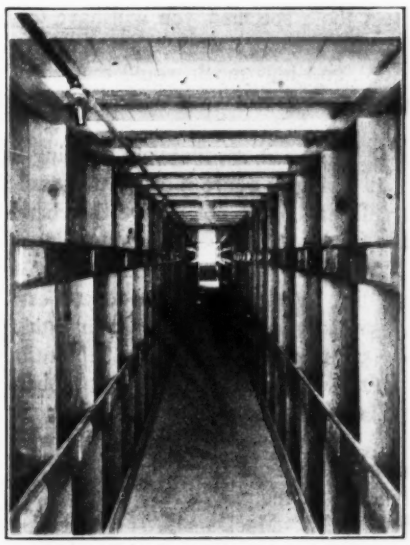
"Next day I made it a point to meet MacDonald at the building, where I greeted him with the warmest cordiality. 'Mr. MacDonald,' I remarked, after we had been chatting awhile, I wish you would have that arch between the floor beams removed, so I can get the boiler into the cellar. I expect it along tomorrow or the next day. Somehow, it seems a pity to me,' I rattled on, without waiting for his reply, 'that it is not a sectional boiler you are putting in. These steel boilers are all right when you know they are large enough, but if too small, you have to tear down a part of your wall to get it out and a new one in, while with sectional boilers all you have to do is add sections.' I paused at that to let my words sink in, but apparently they made no impression. 'Now, in this case,' I purred in my oiliest tones, 'I am satisfied that when Smith & Rundle's girl copied the specifications that I figured on, she made a mistake and copied the size of boiler from the one-pipe system with 2,400 feet of radiation, in the two-pipe system of 3,000 feet radiation.' That shot went home, and for a moment I thought that Alex. had a stroke of apoplexy. His face grew purple, his eyes stuck out and his lank figure became limp as a rag. But he pulled himself together when he saw that I was watching him, and conjured up the ghost of a smile, which was ghastly in the extreme.

"'No danger of that,' he remarked in what he thought was a reassuring tone, but which did not even deceive himself, 'but if such a mistake were made, it would only cost twenty-five or fifty dollars extra for the difference in size of boiler,' and he tried to look as though the matter were dismissed from his mind.

"'I fear you would find it more costly than that if it had to be done,' I remarked dryly. 'But it doesn't matter,' I added indifferently, 'if you are satisfied that the boiler is large enough.' And I left him to think the matter over.

"From that time on I purposely stayed away from the job, knowing he would be on the lookout for me, and determined to make him come out in the open and show his hand. I was not surprised, therefore, a few days later, when Alex., beaming cordiality, came into the shop. 'Morning, Mr. Kelly,' he said, working my arm with a will, 'Has Harper been in to see you yet? No? Well, I recommended you to him yesterday as the best man I knew of to do his work, and he said he would come and see you. Good man, Harper!' he rattled on. 'Good pay, and lots of property. Will pay you to get in with him, my boy. 'Twill be a fine stroke of business and the direct result of doing my work. Told you I would do you a lot of good, and I intend recommending you to all my acquaintances. One good turn deserves another, say I, and you are doing a good job for me, so why shouldn't I do all I can for you?' and again came that softly whistled hymn. Really, I knew what was coming and the part I had to play, but I doubted then if I would be able to hold out against his softly worded sophistries, vague promises and sanctimonious air. I felt somehow that instead of him handing me a lemon, I had played the trick on him. But I conjured up in mind the warning of my lawyer, and girded up my loins to do battle, for I knew the tug of war was not far off.

"'I have been thinking about what you said, Mr. Kelly, the last time we met, about the size of boiler for my apartment,' he remarked in a now-watch-what-a-nice-present-I-am-going-to-give-you tone of voice, 'and have about decided that you know more about steam heating than Smith & Rundle. I am going to let you increase the size of boiler 600 feet,



Storage floors and bins in the Crane Company's new branch at Portland, Oregon, showing bins for soil pipe fittings.

acting entirely on your judgment of the matter. You can see, Mr. Kelly, how much confidence I have in your ability,' and he drew himself up to his full height, to beam on me from a loftier eminence. 'Of course,' he continued, 'there will be a little extra to pay, to cover the size of boiler. Say, one hundred dollars, for instance, and now what has my heating engineer to say?'

"'I fear, Mr. MacDonald,' I replied, dryly, 'that you don't fully understand the situation. You see, I have already ordered a boiler of 2,400 feet capacity, which I will have on my hands if a larger one is put in, and, as the old boiler is worthless to me, I will have to charge you in full for the new one, plus a reasonable profit.'

"'And what would a new boiler cost?' he asked icily.

"'Not less than one thousand dollars,' I replied sweetly.

"'Out of the question, out of reason entirely,' he retorted, hotly. 'I'll not put in a larger boiler. I don't believe it needs one anyway. In fact, Smith & Rundle recommended 2,400 feet of radiation as sufficient. Go right ahead, sir, and put in the boiler you have ordered and cut the amount of radiation down to suit the boiler. You can take enough sections off each radiator to make them correspond with the old marking on the plans, and allow me for the difference in radiation.'

"'Sorry, very sorry, Mr. MacDonald, but to change the radiation now would leave a lot of radiators on my hands, which I might never be able to dispose of. And if you wish radiators of different sizes than those specified, you will have to give me an order for the extra work.'

"Indeed, and how much would that cost?' he inquired in cutting tones that were meant to intimidate.

"'Well,' I replied, meditatively, rubbing my chin, as though trying to figure it out in my mind, 'really, Mr. MacDonald, I do not believe the change could be made for less than one thousand dollars.'

"'Outrageous!' he roared, rising from his seat and standing over me. 'I came to you as a friend and a Christian, to help you for your father's sake, and you try to rob me. Yes, sir,' he continued, his voice rising louder and louder, 'it is robbery, highway robbery, and I will not be victimized. I will denounce you, sir, as a robber, a man who cannot be trusted with work,' and he shook his finger threateningly at me.

"'Softly, Mr. MacDonald,' I replied smoothly, without elevating my voice or rising from my seat, 'not so fast, I pray you. In the first place, let us leave the buried dead out of this transaction, and deal only with the living. We will then get on much better together. You sold me a gold brick, Mr. MacDonald, a sordid brass brick, beautifully gilded, but nevertheless brass. I am willing to put up with the purchase, without protest. In other words, you lied to me and induced me to take for three thousand dollars what Smith & Rundle want thirty-six hundred for. So far, however, I am not complaining, and am not only willing, but am actually going ahead with the work. Surely, then, I am not deceiving or robbing you. But when you ask me to do more work for you, I have the privilege of refusing or setting my own price. If you are not satisfied with my charges, you can go elsewhere to have this work done. That's not highway robbery, is it, Mr. MacDonald? But you are not satisfied. You see the profit of your deceit being swept away, like the dog with a bone, who dropped it trying to snatch that from the shadow, and you cry loudly, "Fraud! Robbery!" You say, you will denounce me as a robber. Well, go ahead. As soon as you do, I will charge you with being a liar *and prove it*. Then you can cry "Robber" for evermore, and nobody will believe you. Come, Mr. MacDonald, will you sign for a new boiler?'

"And he signed."

Factory Sanitation

By Wm. Hey, Plumbing Inspector, Portland, Oregon.

Having noticed the interesting articles on Sanitation in Factories, which have been published recently in "Domestic Engineering" I herewith submit the following views regarding the style and installation of plumbing fixtures for foundries, factories and workshops.

Toilet Rooms.

The location of toilet rooms is very important. Too much cannot be said on this point, as many owners are of the opinion that any place is good enough for a toilet room, and they are generally put in some dark, out of the way place, whereas they should be located in light, well ventilated rooms, entirely separated from the work-shop. With plenty of sunlight and air there is no excuse for dirty ill-smelling toilet rooms.

Floors and Walls.

As far as sanitation is concerned, nothing is better than vitreous tile for floors and walls. This is generally out of the question owing to the cost, and cheaper material, such as Rascolith, or cement may be used. Walls can be painted some suitable color; white enamel paint, while more expensive, is preferable, as it will last longer, may be washed and kept clean, and also helps to make a dark room lighter. The floors should be made and kept water-tight, and be of material impervious to moisture and have floor drains connected

to sewer so that the floors and walls may be washed every evening and kept clean.

Water Closets.

The number of water closets to be installed should depend on the number of employees. One to every fifteen persons is sufficient, but one to every ten is better.

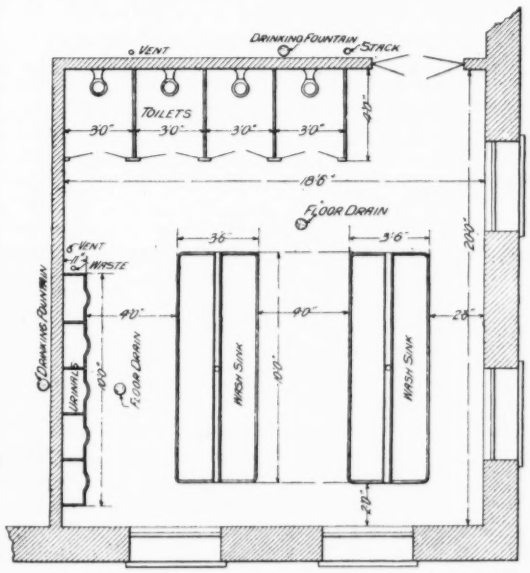
The range or latrine closets are always to be condemned. With such fixtures no room can be kept in a sanitary condition.

The individual closet of vitreous ware is preferable. There are many makes of this closet on the market, such as the wash-down, syphon-jet, etc. The wash-out closet and flush rim hopper ought not to be considered.

With a wall pattern toilet the floor can be kept cleaner, and I would recommend the installation of closets similar to Figure A-2031, "The Adrian," in the "Federal-Huber" Catalogue.

Flushing Fixtures.

This is a matter deserving particular attention, as the after-expense will depend upon the class of material and construction of valves. There are many makes both good and poor for low or high tanks or flushometer valves. I am in favor of the flushometer



Sketch showing floor plan of toilet room to accommodate from forty to fifty persons. Submitted by Plumbing Inspector Wm. Hey, of Portland, Oregon.

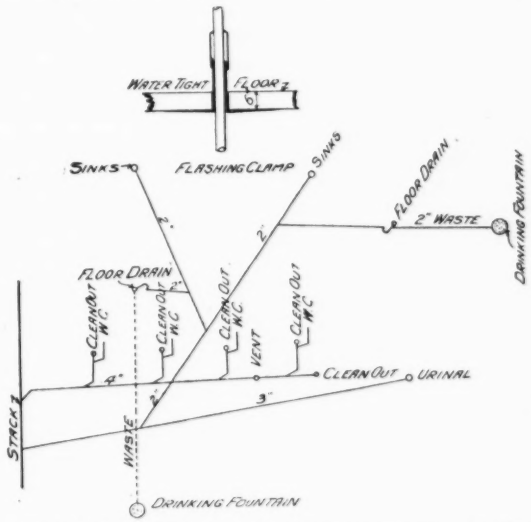
valve as this eliminates the necessity of more than one tank and a good valve need not be repaired more often than a ball cock. With a tank supply the same pressure is always maintained, but this is not true of direct supply and therefore there is trouble in regulating valves.

Urinals.

Beyond a doubt the best urinal on the market is the solid porcelain. This style of urinal is almost out of the question on account of cost and will not be considered. The long trough, cast iron enameled syphon eduction urinal, similar to Plate 6614-A in J. L. Mott's Iron Work's catalogue, is both sanitary and durable if properly installed. It should be installed with at least 12-inch back, automatic tank, and with brass perforated pipe, so as to keep the whole surface of both back and urinal wet.

Partitions For Toilet Room.

Wood should be used as little as possible in the toilet room. Enameled iron partitions are preferable, but if too expensive galvanized sheet iron can be set in a pipe frame and painted. Partitions must be at



Sketch of drainage plan for toilet room accommodating from forty to fifty persons. Submitted by Plumbing Inspector Wm. Hey, of Portland, Oregon.

least 6 feet 6 inches from the floor to top; bottom of same to be not less than 10 inches above the floor. Each closet ought to be partitioned into seperate compartments and be provided with a door. It is very necessary to have the door to toilet room provided with check to keep it closed.

The accompanying drawing is the floor plan of a toilet room that will accommodate from forty to fifty persons.

Lavatories.

This is a matter which lies entirely with the owner. If an employer has any regard for his men he will see that they are provided with plenty of hot and cold water for lavatory purposes. The bucket is used only when employees are obliged to secure hot water elsewhere.

If small lavatories are too expensive, a long enameled sink with 12-inch back and with combination compression bibbs for hot and cold water, (Plate 4573-A in J. L. Mott's Catalogue) placed 2 feet apart, sink similar to pattern 4570-A in J. L. Mott's Catalogue, is very desirable. I believe these sinks can be had in any length, the size to be decided upon in accordance with the number of employees. The temperature of the water can be regulated by the use of combination faucets.

In a foundry, or in fact any place where the work is dirty, shower baths should be installed. Compared with the amount of good which may be derived the expense is a small item. It would require a boiler to supply hot water, a few showers, and a water-tight floor with suitable drain to carry off waste water. There is sufficient steam going to waste in the average factory to supply more than a dozen boilers. This room ought to be heated to 70 degrees.

By making full provision, slovenly employees may be encouraged to habits of cleanliness, and others whose home surroundings afford them no such convenience would gladly avail themselves of the accommodation.

Soil, Waste and Vent.

Material should be extra heavy cast iron for soil and waste, and galvanized iron for vent. If the building contains machinery which causes considerable vibration when it is in motion, then I would recommend galvanized iron pipe for soil, waste and vent, with special galvanized recessed drainage fittings. Lead traps are not practicable. For urinals and lavatories heavy cast iron traps will prove less expensive in the end. This "get quick" tubing used in traps and supplies should be condemned, and the person that allows this class of material in his building is getting skinned.

Drinking Fountains.

Drinking fountains should be installed on each floor, and either 4916-A in J. L. Mott's catalogue or 1166½-Z in Crane Co.'s would prove satisfactory.

If the foreman or employer of a work-shop or factory would inspect the toilet rooms of his employees every day, or at least twice a week, see that they are kept clean, and if not discharge the person of filthy habits, he would have little trouble in keeping the premises clean.

Toilets for male and female employees are to be separate in all cases and be in different parts of the building or on different floors. All toilet rooms must be heated at about 50 degrees.

Drinking Fountains if placed as shown in plan should have waste run on house side of traps for floor drains to keep traps constantly supplied with fresh water.

The Soil Stack is near the door in the plan on the outer side of toilet room and has 3-inch branch from sinks and urinals. This line should be exposed on ceiling below toilet room.

The sinks should be set back to back and far enough apart to allow a 2-inch vent to be carried between them.

Four inch branch for closets should be above floor and have cleanouts easily accessible. Each closet may be vented separately or the "yoke" or "circuit" vent used. If the latter is used it should start between the last two fixtures. Vents should not be placed on the end of any line, as there is invariably an accumulation of filth so situated that there is no way to flush it.

Where pipes come through the cement floor they must be flashed with sheet lead or copper. This is necessary to allow pipes to expand or vibrate with the building and avoid having floor leak. On the pipes above the flashing clamp a larger pipe to slip over same about two inches. These pipes should be flashed the same as on the smoke-stack of a steamship.

In the summer when drinking water gets warm an ice box could be made containing a block tin coil about 50 feet in length, and the water passed through this coil before furnishing the fountain. The cost of the ice would be nominal compared with the benefits derived.

Bookkeeping for Plumbers

By Phoenix.

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Several requests have lately been received from places that are over the hills so far away and these parties desire some light shed upon that much discussed problem of bookkeeping in the shop. I will, therefore, proceed to scatter a few remarks upon the subject.

Before I start let me say that the ordinary plumber greatly overestimates difficulties of this part of the business, and from carelessness allows matters to get into a thoroughly mixed-up condition before he starts to straighten them out. It is a curious circumstance, but a fact nevertheless, that a good percentage of plumbers do not seem to have a desire to know where they are at and merely adjust the business once a year. Perhaps by that time, after worrying and sweating through the accounts and bills, they find that there is no business left, and they often wonder why. I have known men to labor hard, use the best material and put in good work and yet go "broke" in less than four years' time, and yet they started with a fair amount of cash and stock. Others have begun on wind and put it through, and in less than five years' time have succeeded in building up a good paying business. The first person to be considered is the owner of the business himself. He must resolve to **take work at a profit only,** and then find out to a dead certainty how this act is to be accomplished.

There are several points to be considered, among which the following are prominent:

First: The plumber should know how much money he has tied up in the business.

Second: He should have a reliable estimate blank. One that can be depended upon and so arranged that when he arrives at the end nothing will be left out, and the sum will represent what the time and goods will amount to.

Third: Tags or slips should be issued to the men by means of which they can keep a strict account of their time.

No material should be allowed to leave the shop unless it is charged to the proper job, in the accepted manner, by the man doing the work who should be held responsible.

Fourth: This does not represent the actual expenses of running the shop, which each master must find out for himself. **Find out, therefore, what it costs to do business.** Get at the sum which represents your **total expenses.**

There are two steady streams, so to speak, of money. One stream flows into the shop and the other flows out, and when the money going out exceeds the money coming in, it is time to call a halt and look for the leaks.

Returning to the first point: Know how much money

you have tied up in the business. Every article should be listed at the proper price. Fixtures, benches, tools, horse, wagon, etc. The pipe, fittings, boilers, closets and other material used daily will fluctuate; but it can be ascertained quite readily every month, or twice a month, if desired, so that the master can have an exact idea of where he is at. Therefore, from time to time through the year it is a mighty good plan to find out how much money is invested in the stock.

No one, unless he has had many years' experience in the business, can make an exact estimate of the material actually required on a plumbing job if he does not have something to use as a guide. This requires an estimate blank.

A good form for a plumbing estimate was published in the department of "Questions and Answers" in "Domestic Engineering" in the issue of December 4, 1909.

This estimate divides the job into different parts and lists the material with each particular fixture, and the sum total can then be easily found. This plumbing estimate so clears and spreads out the different amounts that they may be seen at a glance, and this, or any other reliable estimate sheet should be filed for future reference. Without some reliable, simple and accurate means of keeping track of the time and material upon jobs and day work, the shops would soon go on the rocks. These time sheets should not be too complicated nor should they be many in number. The office may have another set if desirable. Let it be remembered that the less red tape applied the less friction is liable to result, and also in the simpler systems it is easier to get quick results, and again there is less chance for mistakes. When the master has accomplished the foregoing and also ascertained his total expenses, he is in shape to open up a set of books and know what he is doing and how to give prices on work.

Doubtless many have thought: "Why, get the books and open up the accounts, and that is all there is to it." By this time you can see that there are a few things to be taken into consideration **before** the books receive the mark of a pen.

Now a regular bookkeeper, who is not acquainted very much with the way a plumbing business is run, will before many twilights, have matters so thoroughly "scienced" that the services of an expert may be required to unravel the mystery. This is what gets the average plumber, and it is one of the reasons why he has such a horror of going into details to find out his financial condition.

He is a plumber, remember, not a bookkeeper, while the other is, many times, a mere bundle of figures, who exists upon addition, subtraction, multiplication and division, and frequently never acquires the faculty of using common sense. Let one of these people run the system and ask, "How much have I got going out and coming in?" And it will take several days to find out. Rather than do this I would rise to the occasion and **invent a system of accounts** for myself if I had to keep them on a shingle.

Better a **classified shingle** list than the complicated constructions of some so-called expert bookkeepers. I would bunch the jobs, if necessary, in one book and arrange each job so its total expense and profit would show up on one page, if it could be so fixed. I would have my total expenses in another book and my cash bank account all to itself in a little morocco volume with gilt edges. It would require but a quick glance to look through these three books and one's financial standing could be figured out in a few moments on the back of any old envelope which was handy.

This trial balance business and delving deep into the mysteries (self-made) of figures never made a hit with yours truly, when I know it is possible to lay out the business so one can see, at almost a single glance, the exact state of affairs, and here is the beauty of the scheme: **You can do it yourself and not depend upon another person's figures.**

It is necessary, in order to have such a system work accurately, that a **full** record be kept of what is done each and every day.

No hit or miss guessing should be permitted by any one and the master should be as honest and fair with himself **as he requires his employees to be.** If this is done, I see no reason why bookkeeping should be accounted such a bug bear by the craft nor do I believe a course in that art necessary in order to successfully keep track of the business done in the average plumbing shop.

Bringing Men into the Game*

Based on an interview given by Richard T. Crane, of Chicago.

CONCLUSION.

Monthly tests in progress and competence are held and from the "high men" are chosen bill clerks, invoice clerks, stock clerks and the like as fast as men are needed. From the last class, averaging thirty-one members, thirty promotions were made within twelve months.

Here are two elements in the breeding and maintaining of efficiency—satisfactory raw material, and clear and exhaustive instruction. For one employee in ten they were enough: his industry and application would drive him to get results. For the other nine, however, there must be incentives, rewards for good work, penalties for bad: coupled with plain and tangible machinery for keeping track of both errors and accomplishments and distributing rewards or reprimands. A record of individual efficiency is not enough. To influence the employee he must understand that such a record is kept and know that promotions, wage advances and discharges depend upon it.

The Crane method of keeping in touch is a special system of reports dealing with department heads and their understudies. Each executive is required to send to Mr. Crane a monthly report, summarizing the history and progress of the men under him in direct line for advancement. The compensation of these men, their special abilities, their suggestions or improvements and incidents indicating executive ability are all set down.

No temptation exists to belittle the understudy or his work: the head knows he is judged as much by what his assistants are accomplishing as by his own endeavors. In the minor ranks, this record of efficiency is kept by the employment bureau from cards and reports furnished by the bosses, and from its own observations. Once a

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month the bureau reports to the president: in effect, it is his eye on the whole complex fabric.

Once a year, sometimes oftener, the president and his cabinet go over these human material reports and discuss the individuals who have achieved unusual things and the rewards to be given them The shop and office executives are also weighed in the balance, their progress or failure noted, their salaries fixed, their promotion or discipline determined. The current report is compared with the last. Frequently the questions are asked: "Where is John Smith? Last year his ability as understudy of John Jones was commended. Did he leave or was he discharged? Why?"

That "why" is the corrective which insures justice to the men below executive rank Every good man who quits is a black mark against his boss. Judging between boss and understudy, when friction arises, the "front office" is an impartial court. If the executive is in the wrong, no false idea of discipline intervenes to shield him.

This continuity of service which is so important an element of efficiency is secured by concrete methods calculated to check resignations and discharges. For example, every factory employee who leaves the company's service receives his pay-envelope through the employment bureau, thus giving the head opportunity to inquire into the reasons, to hear his complaints or discover the incentive which draws him to another house. What he learns is reported directly to Mr. Crane; if any taint of unfairness attaches to a discharge it is adjusted, if a condition is to blame it is at once remedied.

No efficient workman or clerk is allowed to leave if reasonable measures will retain him. If there be friction in a department, petty jealousies or unfair treatment by superiors, knowledge of the fact is uncovered and the offender disciplined. The inquiry looks two ways; to the righting of the immediate wrong and the retaining of the competent employee, and also to the elimination of a condition lessening the efficiency of all.

This is civil-service pushed a step beyond the cut-and-dried government system. Loyalty and the common interest are superimposed. The employee desires nothing so much as a steady job; in any analysis it is a big factor in wages. The company wants seasoned men since skill comes of practice and the cost of "breaking in" new clerks or mechanics can easily over-weight the pay-rolls. For both, continuity of service is the ideal.

"The efficient organization," says Mr Crane, "has the minimum of changes. It does not follow, of course, that an organization is good because it is permanent, stable. System and methods may simply be incapable of pointing out efficiency or inefficiency. In normal times, however, too many pay-offs are a sign of serious weakness somewhere.

So basic is this idea of continuity that men not likely to remain long in the company's employ are not hired. Recently a mechanic unable to secure his usual grade of work, offered to take a job at twenty cents an hour. His application blank showed that he had received thirty cents at his last place. Though perfectly competent to take the cheaper job, he was rejected. It was argued that he

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would quit the twenty-cent-job just as soon as something better offered. In addition, his efficiency would suffer by reason of his discontent with his job and his constant search for his proper grade of work.

"The spirit in which orders are obeyed or work executed is vital," Mr. Crane declares. "Good will, enthusiasm, are the lubricants which make the machinery of business run without friction or lost motion."

Promotions are based on efficiency. The Crane idea of efficiency is rooted in competent service in the position a man holds. It encourages employees to learn all they can about the business; but the primary test is faithful execution of the work in hand.

"When several men are eligible for promotion," Mr. Crane explains, "we study their records, their personalities, their potential qualities. Choice does not always fall on the man who has produced or sold more goods than the others—though results count heavily. The man best qualified for the place may be the one who shows promise of possessing tact, broad-minded judgment and sympathy in handling other men. What a man has done is important as showing his initiative, energy and power of execution: it is capacity that wins."

Keeping in touch monthly with the efficiency and potential qualities of employees through the human material reports, the choice of the man to be advanced is usually simple. If he can't be named off hand, comparison of reports gives the measure of each candidate's development and helps to differentiate mere fidelity from efficiency plus vision and loyalty. Asking faith and absolute loyalty, the company tries to give both in return.

Fair Dealing With Men Pays from All Standpoints.

"Justice," Mr. Crane says, "is the first thing to be considered in dealing with your men. It is also the first thing to make sure of when choosing those who will execute your orders and carry out the house policies. And justice, in its widest sense, includes kindness, courtesy, sympathy and genuine interest in the welfare of your employees. From a purely selfish view point, all these things pay because they contribute to efficiency in an organization.

"Enlightened self-interest is, in fact, the essential bond of any organization. Mere appeal to sentiment, counts for nothing. An employee is one with the house only when it affords him the best opportunity to coin his talents or skill into dollars and cents and insures him of permanent employment. Even the apprentices we take into the shops are not held by formal contract. As a matter of fact they usually stay and virtually all our department heads and managers learned their trades with us or began as messengers. The certainty of advancement, if they deserve it is a stronger incentive to steadiness and efficiency than any formal contract could be."

Impartial fairness to employees, consideration and development of their powers, regard for their feelings, justice in promotions—all these make for efficiency and loyalty. They are not enough, however. The house which reaches the pinnacle of man-power in its organization recognizes also that money is the first and final meas-

ure self-interest knows in business, the standard by which every man judges the company and his obligations to it, the tangible reward for which he works.

In addition to his wages, therefore, the Crane Company gives every employee a share of the year's profits when the year is done. This annual distribution reflects the prosperity of the house and its satisfaction with the men who helped to make the profits. In a good year, the bonus amounts to ten per cent of what each employee has earned in wages or salary. In the eight years the plan has been in operation, more than $2,100,000 have been thus distributed.

The company's relief and pension funds—supported entirely by the house and providing payments based on the necessities of the employee and his dependents—and the medical supervision of the health of workmen and the working conditions at the plants, Mr. Crane regards as indirect profit sharing—profitable manifestations of the justice and self-interest on which he has built his organization and his business.

Making each man a partner in the business, a sharer in its profits, reacts on both house and employee, he believes. The latter's effort is to earn top wages and insure his extra dividend by helping the company to the maximum output and uniform quality which give the fullest harvest of profits. The identification of the employee with his work and with the business—the ideal in production—is reasonably complete.

"Distribution of part of our profits to employees, both directly and indirectly, pays," is Mr. Crane's way of putting the case. "It is a good investment. It comes back to the company in the way of better service, of greater enthusiasm, of a more coherent working force and increased attention to individual tasks, of a more pronounced loyalty to the company and its interests.

"I believe in profit-sharing as a business principle. No greater incentive to efficiency, loyalty and continuous service—the qualities which make an organization great, invincible and permanent—can exist than the fairness which goes beyond the letter of the wage-contract and shares with the employee the overplus his cooperation has created."

Questions and Answers

THE HEAT UNIT.

280.—Seattle, Wash.—To the Editor of "Domestic Engineering." Sir: Being but an apprentice in the heating business, I desire to ask you for an idea as to what a "heat unit" is, and trust that you may be able to give me the information in your department of "Questions and Answers," which I read regularly with great profit. **C. R.**

In the book called "The Principles of Heating," by Wm. G. Snow (for sale at our office), he says: "What the pound is to the grocer, and the two-foot rule to the carpenter, the heat unit should be to those engaged in heating and ventilating work."

"It is the unit of measurement and the common sense basis of all heating calculations.

"Briefly stated, a heat unit is the amount of heat required to raise the temperature of one pound of water 1 degree F."

ABOUT BRONZING RADIATORS.

278.—Rochester, N. Y.—To the Editor of "Domestic Engineering." Sir: I read your article on decorating radiators and wish to ask if it would be advisable to mix bronzing liquid with the paint. Would it make a better job? I await your answer. **F. N.**

We have never done this and do not think it would be a success. If a first-class, especially smooth job were desired we would advise using some reliable brand of radiator enamel which would give, we believe, satisfactory results.

THE SIZE OF GREASE TRAPS.

Springfield, Mass.—To the Editor of "Domestic Engineering." Sir: Please tell me what should be the proper size of a grease trap, and oblige. **W.**

In general terms on ordinary installations it may be stated that the grease trap should have about twice the capacity of the most water that will be discharged into it at one time. If the trap is too small, some of the water containing grease will pass into the drain pipes and become cool, thereby, at length, causing trouble and a call for the plumber.

WHAT ABOUT RAIN LEADERS?

287.—Olean, N. Y.—To the Editor of "Domestic Engineering." Sir: I should like a little information regarding the installation of rain leaders, through the columns of "Questions and Answers" in your valuable paper, which I read with much interest every week. **Soldering.**

This branch of the work may be divided into two classes, the inside and the outside rain leaders. Those which are inside are generally made of cast-iron or wrought-iron pipe and should be perfectly tight in every respect. The outside leaders are generally made from sheet metal and are connected together with slip joints. It is customary to make leaders of cast iron for five feet, at least, above the grade of the ground and then connect with the sheet metal pipe.

These rain leaders are to be trapped with a running trap, which is generally placed in a place which will be entirely protected from the frost's action, though sometimes the trap is omitted in certain instances, where there is no conflict with the sanitary regulations.

WATER HAMMER.

288.—St. Paul, Minn.—To the Editor of "Domestic Engineering." Sir: Please give me an explanation of water hammer in pipes on plumbing jobs and how it differs from water hammer in steam pipes? **Minnehaha.**

In plumbing jobs water flowing through pipes has, when a faucet is opened, established a moving column of water in motion. Now this water is confined. It cannot expand or **"squsb"** back, so to speak, because it is held in place by the walls or sides of the pipe. Consequently if the faucet be closed quickly (and there are no air chambers in the job) the water comes bang against the faucet and a noise ensues, which is termed "water hammer." In steam pipes this water hammer

generally results when the boiler lifts water into the mains, or when a steam pipe is trapped and pockets water. The steam enters this water and becoming condensed suddenly creates a vacuum which contracts suddenly and produces the noise.

HOW MUCH LESS COAL FOR VACUUM HEATING?

Clyde, N. Y.—To the Editor of "Domestic Engineering." Sir: How much less coal will an ordinary vacuum heating apparatus for a dwelling consume than the ordinary gravity steam job? Where can I get exact information on this subject? **Seneca.**

Various manufacturers of apparatus along this line claim that the vacuum system if properly installed and run will save anywhere from 25 per cent to 33 per cent of coal as compared with the ordinary gravity steam systems.

We believe that you could secure instances of this by writing to several of the firms who advertise in the columns of this paper, all or any of whom, we believe would be glad to give you this information.

HOW TO COMPUTE NUMBER OF FEET FOR COIL INSIDE HEATING TANK.

286.—Buffalo, N. Y.—To the Editor of "Domestic Engineering." Sir:—Can you give me any directions for finding the size of a heating coil required to heat any certain amount of water.

Any information on this subject will be read with great interest. **Ellicott.**

In the excellent work, "Principles and Practices of Plumbing," by J. J. Cosgrove, we find that in figuring "the heating surface of copper or iron pipe in steam coils, the inner circumference of the pipe must be taken, as that is the real heating surface to which heat is applied. The average temperature of the water in contact with the coil is taken as the temperature of the water." The following example will illustrate this rule:

Example.—How many square feet of heating surface will be required in a copper coil to heat 300 gallons of water per hour from 50 degrees to 200 degrees, Fahr., with steam at 15 pounds pressure?

Answer: $300 \times 8.3 = 2{,}490$ lbs. water to be heated. $200° - 50° = 150°$ = rise in temperature of water. $250°$ = temperature of steam at 15 lbs. gauge pressure. $250° - 125° = 125°$ = difference between temperature of steam and average temperature of water. Substituting values in formula we have: $S = \frac{2490 \times 150}{300 \times (250-125)} = 9.9$ sq. ft. of coil.

It may be remembered that the rule and formula which applies to this case, as given by same author, is as follows:

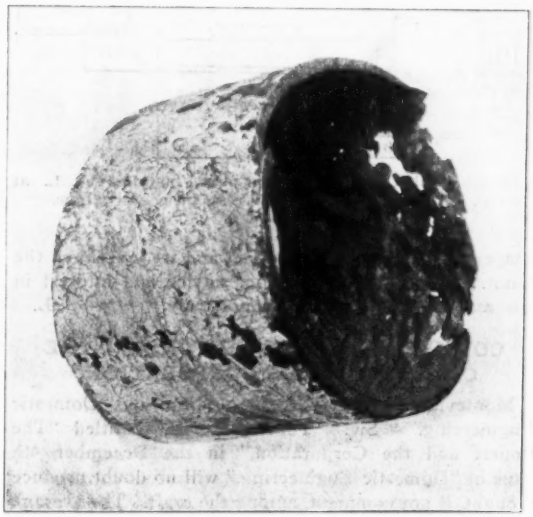
Rule: Multiply the weight of water in pounds by the number of degrees Fahr. the water is to be raised, and divide the product by the coefficient of transmission times the difference between the temperature of the steam and the average temperature of the water. The formula is $S = \frac{w\ r}{c\ (T-t)}$

s = surface of copper or iron pipe in sq. ft.
w = weight in pounds of water to be heated.
r = rise in temperature of water.
T = temperature of steam.
C = coefficient of transmission.

The value of "c" for copper is 300 B. T. U. and for iron is 200 B. T. U. transmitted per hour per square foot of surface for each degree difference between the temperature of the steam and the average temperature of the water.

SEWER PIPE AFTER TWENTY YEARS' SERVICE.

291. Philadelphia, Pa.—To the Editor of "Domestic Engineering." Sir: I am sending you herewith a piece of 8-inch pipe taken from a horizontal run of sewer pipe which was hung in one of the basements in the old Waldorf Hotel, New York. This installation had been in service about 20 years, and the pipe shows for itself what the action has been upon it. There has been a wide difference of opinion as to what caused



Photograph of a piece of 8-inch sewer pipe which has seen twenty years' service.

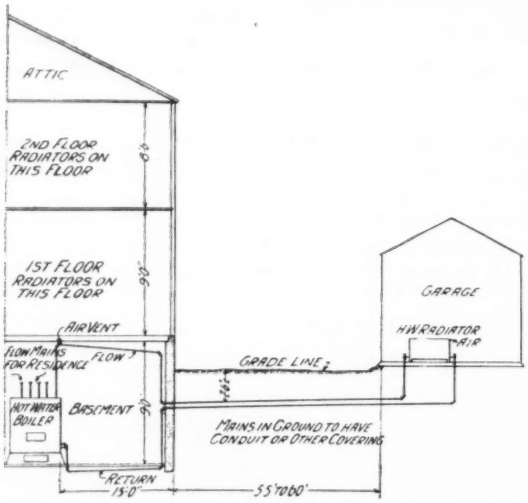
the disintegration of the pipe, but it did seem to me that one of the prime factors was the fact that the pipe was absolutely too large for the service required of it, it being shown that only half of its diameter was being utilized. This pipe was removed from a corridor used as a passageway daily, where there was no dampness. **S. V. V. Hoffman.**

THIS SYSTEM HEATS THE GARAGE.

Several communications have appeared with reference to the sketch, which we herewith reproduce. When the question was asked, it was desired to know if the job would work, provided a pressure appliance was put upon the job and we stated that, in our opinion, it would. For the benefit of the "doubting Thomases" we publish below a letter from the parties who installed the job. **Ed.**

Merrill, Wis.—To the Editor of "Domestic Engineering." Sir: "In reference to our sketch of hot-water

heating job with run to garage, which you published in "Domestic Engineering," would say that the job works "O. K." This run as natural, and as expected, is the last run to heat. Have not, as yet, taken any data of



Sketch of hot water heating plant installed by L. at Merrill, Wis., which heats both residence and garage.

temperatures, etc., but will do so and let you know the result. Thanking you for your advice and interest in this matter, we are, Yours truly, L.

COMMENTS ON OUR EDITORIAL, "THE COURTS AND THE CORPORATION."

Montevideo, Minn.—To the Editor of "Domestic Engineering." Sir: Your editorial, entitled "The Courts and the Corporation," in the December 4th issue of "Domestic Engineering," will no doubt produce thought, if not comment, among the craft. The average journeyman or mechanic does not find civil government an interesting topic. They neglect to study the problems of government. In your editorial you say, that the Supreme Court has the respect and confidence of the people, that it is free from "passion and prejudice," and therefore will correctly interpret the law.

When the Dred Scot Decision was handed down, to what court did the American people appeal? And at what sacrifice did it save the Union? When General Jackson was struggling manfully with this institution, how many of his followers had either respect for or confidence in it? When our nation was born the Supreme Court was instituted as one of many compromises, and a patriot declared at that time that when this nation was overthown, a decision of this court would bring about the overthrow. All selfish interests must necessarily turn to this court of last resort, and strive to get recognition and favor.

As the slave-holder depended on the Supreme Court, so combinations in restraint of trade will now appeal to it. When a decision is handed down it will not establish "rights of capital or labor" unless the American people accept it. They constitute the court of last resort, their decisions are final and just. Kings and courts may err. The people cannot. They would tolerate combinations, but not conspiracies. They would tolerate labor unions when unselfish and peaceful.

The grandest characters developed among Americans have been those who had the most confidence in and love for the people. The most loved individual in any community is the one who loves most.

People are quick to detect the good or the bad. They have lost confidence in the daily press, consequently the press has no influence. What better proof could be produced of their competency for self-government. The Federalists and Tories are in their graves; their ideas of government were buried with them, with one or two exceptions.

Senators should be elected by the people. The people should have a referendum call on the Supreme Court. They will call when occasion requires, even though it be a call to arms, as during the rebellion, when the decision of the Supreme Court had to be reversed. God grant that there may not be another such call; that capital and labor may yet learn to obey that second great command, and loving one another, submit their differences to the people.

Capital has always been afraid of the people through all the world's history. The people, like Samson have pulled down the temple, even though they were buried in the wreck.

There never was a time more opportune to preach tolerance and forbearance and to extend by every means the civil power of the people.

Joint wipers and engineers can accomplish much good for the craft by keeping their eye on the political horizon.

The old patriot, Benjamin Franklin, when signing the Declaration of Independence agreed that they must hang together or all would hang separately.

The same condition exists today. Americans must hang together. Yours fraternally,

Geo. H. Claggett,
Mayor of Montevideo, Minn.

One Idea of Economy.

"What do you mean when you tell the people they ought to economize?"

"I mean," said Mr. Dustin Stax, "that they ought to go slow in patronizing most business enterprises in order that they may have more money to spend with mine."—Washington Star.

For Convenience.

The depot of Meridian, Tex., is about a mile from the business part of the town. One night a sleepy, weary traveling man said to the darky who was driving him to the hotel:

"Old man, why in the name of heaven did they put this depot so far from town?"

The darky scratched his head in thought and replied: "Waal, boss, I's forced to admit dat I hasn't give de matter s'ficient cogitation, but I s'pose dey done dat so as to have de depot as near as possible to de railroad."

WHOLESALE PLUMBING AND HEATING NEWS

National Association of Brass Manufacturers holds Annual Meeting in New York and Elects Theodore Ahrens as its President

The Zander Plumbing Supply Company incorporates to enter Plumbing and Heating Supply Trade at Buffalo, N. Y.

THE ANNUAL MEETING OF THE NATIONAL ASSOCIATION OF BRASS MANUFACTURERS.

The National Association of Brass Manufacturers held its annual meeting at the Hotel Astor in New York City on Wednesday, December 8th. The meeting, which was well attended decided to adopt "a uniform center of 7½ inches for all styles of bath cocks with offset supplies," so that this will hereafter be the standard measure for these fixtures by all manufacturers.

Theodore Ahrens, of Louisville, Ky.
President of the Standard Sanitary Mfg. Company and newly elected president of the National Association of Brass Manufacturers.

The meeting also directed Commissioner Wm. M. Webster to appear before the Transportation Associations to plead petitions filed for the equitable adjustment and modification of existing classifications of freight rates. The following officers were elected for the ensuing year:

President, Theodore Ahrens, of Louisville, Ky.

Board of Trustees: A. S. Hills, of Haydenville, Mass.; **D. H. Roberts,** of Detroit, Mich.; **C. C. Hale,** of New Haven, Conn.; **W. H. Wasweyler,** of Milwaukee, Wis.; **Fred Somerville,** of Toronto; **J. W. Sharpe, Jr.,** of Philadelphia; and **Theodore Ahrens,** ex-officio.

Delegates to the National Committee: J. J. Ryan, of Chicago, and **C. K. Sanborn,** of New York City.

The association will hold its next meeting in Cleveland, Ohio, March 16 and 17, 1910.

ZANDER PLUMBING SUPPLY CO. INCORPORATED.

The Zander Plumbing Supply Company, of Buffalo, N. Y., has been incorporated with a capital of $100,000, of which $50,000 in cash has been paid in. The new company will deal in plumbing and heating supplies and it has leased two large buildings at 77, 79, 81 and 83 Broadway, Buffalo, for a long term of years. These buildings are now being fitted up and it is expected that the new company will be ready for business by January 15, 1910. Fred W. Zander, the president and general manager of the new concern, is well known to the plumbing trade in Western New York, where he, for fifteen years, has been eastern representative of the L. Wolff Manufacturing Company, of Chicago, with headquarters at Buffalo. His host of friends in the trade wish him success in his new venture.

H. O. CANFIELD CO. TO BUILD LARGE ADDITION TO ITS PLANT.

The H. O. Canfield Company, of Bridgeport, Conn., has decided to erect a new storage building on Housatonic avenue, in that city.

OPENS NEW BRASS FOUNDRY.

The Turnbull-Smith Company, of Syracuse, N. Y., has recently equipped a new brass foundry for its own and contract work.

WILL MAKE HEATING SPECIALTIES.

The Ohio Heating and Manufacturing Company, of Cleveland, O., has been incorporated with a capital of $10,000 to manufacture heating specialties. Geo. D. Hile is interested in this new company.

TO MANUFACTURE HEATING BOILERS.

Somerville Stove Works, of Somerville, Mass., has been incorporated with a capital of $125,000 to manufacture stoves, heaters, steam boilers and castings. The incorporators are Michael Baum, Charles L. Voorhees and James Q. Ten Eyck.

ATLANTIC RADIATOR CO. INCORPORATED.

The Atlantic Radiator Company, of Tyrone, Pa., has been incorporated under the laws of the state of Delaware with a capital of $450,000 to manufacture radiators. The incorporators are Ed. P. Harrington, of New York City; O. Perry Sumter, of Tyrone, Pa.; George L. Townsend, of Wilmington, Del.

BUILDS LARGE ADDITION.

John Weekes & Son Company, of Watertown, N. Y., is completing an addition to its plant in that city on

Factory street, 50x30 feet, three stories high. The addition will be occupied by its valve department. This company will also shortly erect another addition of the same dimensions for the general use of its growing jobbing business.

WILL BUILD PLANT FOR THE MANUFACTURE OF RADIATORS AND BOILERS.

The Seamless Pressed Steel Company, of Dayton, O., will erect a large plant at Redkey, Ind., for the manufacture of radiators and heating boilers. The officers of the company are: C. S. Gunderson, president; Otto Kolb, vice-president; R. T. Haines, treasurer; L. C. Stoltz, secretary.

BUYS LARGE PLOT OF LAND FOR ADDITION TO PLANT.

The Pittsburgh Seamless Tube Company, of Pittsburgh, Pa., has completed a deal whereby the purchase of a tract of about fifteen acres of land adjoining the present plant at College Hill, Pa., was consummated. The purchase price was $32,000. The company is now having plans and specifications prepared for the erection of a large addition to the present plant, and these improvements will cost an additional $100,000, exclusive of the machinery and other interior equipment which will be installed. The addition will be used as an open hearth department, as the company has decided to make its own billets instead of purchasing them in the open market as has been the custom in the past. The erection of the addition will hardly be started before the early part of next spring, according to present plans, but will then be rushed to completion as rapidly as possible.

THE CHICAGO PLUMBING SUPPLY BOWLING LEAGUE.

The Chicago Plumbing Supply Bowling League held its weekly tournament at Schindler's alleys on Huron street, near Milwaukee avenue, Chicago, on Thursday evening, December 9. The eight teams, composing the league were all fully represented, and an interesting series of games were enjoyed. The L. Wolff Mfg. Co.'s team carried off the honor of the evening with an average of 866 for the three games, while Secretary Faehse and M. Rademacher, of that team, had the best average of the evening with 181 for the three games. M. Rademacher also had high score with 213. The official score record for the evening follows herewith:

	1st game.	2nd game.	3rd game.
L. Wolff Mfg. Co.	864	879	855
Republic Mfg. Co.	653	747	720
Cameron-Schroth-Cameron Co.	749	829	814
Illinois Malleable Iron Co.	683	682	744
Davies Supply Co.	741	720	662
Weil Bros.	719	627	688
Federal-Huber Co.	803	749	855
Western Plumbing Supply Co.	614	722	732

Thinking of Something.

Church—"They say that a ton of water contains 224 gallons."

Gotham—"Yes, but I wonder how much of that is milk?"—Yonkers Stateman.

THE METAL MARKET

INTEREST IN IRON MARKET CENTERED ON SECOND AND THIRD QUARTER NEXT YEAR.

Cincinnati, O.—There is not a great deal to say about the pig iron market, for, to tell the truth, there is not much of a market, says Matthew Addy & Company's letter. Business is mostly of the small potato kind, though there is something doing right along. There has been one sale of 1,000 tons this week of foundry iron for forward delivery and there is a considerable interest in iron for shipment over the second and third quarters of next year. Buyers are pretty well filled up for their immediate wants and are much more interested in iron for delivery in the middle or latter part of 1910 than anything else. There is apparently a universal opinion that next year will be a boomer. Opinions all agree that next year there will be a greater volume of business in the iron trade than the country has ever seen, and it is anticipated that soon after the opening of the new year there will be another buying movement, and it is expected that this will be of proportions equaling or surpassing the one of the early fall. At the present, however, carload transactions are more frequent than anything else and consumers are filling in gaps here and there in this manner. Prices are holding firm and the fear that seemed so general a few weeks ago that speculative or resale iron would have a disastrous influence on the situation has not been realized. As a matter of fact the amount of speculative iron available has probably been greatly exaggerated, for it is tolerably certain that if anyone wished to purchase a large block of iron for prompt shipment he would have difficulty in finding it.

CONDITIONS IN THE COPPER MARKET.

Chicago, Ill.—Dr. D. C. Jackling, president and general manager of the Utah Copper Company, who has just returned from the West, is quoted as follows: "Conditions in the copper market are better than those in the markets for either lead or silver, at the present time. There has been a great increase in production of all metals during the past year, and the demand has not been proportionate to the supply. Increased production in copper is due in large measure to the output of companies working the low grade properties, such as the Nevada Consolidated, Boston Consolidated, and Utah Copper companies. These porphyry deposits are becoming prominent factors in production, and the cost of production is being reduced all the time, at least in the case of Utah Copper. This reduction in cost production is due to improved commercial conditions, improvement and advancement in metallurgy, and other contributing reasons. While the increase in production of copper this year will be above normal there is nothing alarming in the situation. Consumption of copper is on the increase in all departments, both at home and abroad, and it would take only a very short time to exhaust the present visible supply, were it not being continuously replenished by production. Admittedly most of the increased production this year comes from so-called porphyry properties, and this fact has given rise to a false impression, namely, that the discovery of new porphyry deposits will continue indefi-

nitely. That is not the case, as most all of the copper deposits are already known, and have been known for many years. The first mining in Utah, for instance, was done before 1860, and Ray Consolidated was a producer in 1872. Spaniards worked Chino mines in 1804, so you see these are not new discoveries, but, on account of the low grade of the ore, have only recently been worked to advantage. These low grade copper deposits are all known, and since it has become profitable to work them by the new process, they have all been opened up and made productive. Development work in Utah goes on with unabated energy, and since the last report at a rate of four to five times that at which ores were extracted for reduction. Of 80,000,000 tons developed, about 65,000,000 can be classed as averaging 2 per cent copper, and 15,000,000 tons as of a lower grade, averaging 1½ per cent copper. In addition to this we have indicated by diamond drilling a zone which is estimated to contain a minimum of 40,000,000 tons, which will probably average 1½ per cent copper."

NEW YORK METAL MARKET, DECEMBER 14.

Copper, Prime Lake	$13.62½
Copper, Electrolytic	13.45
Lead	4.50
Spelter	6.30
Antimony, Cooksons	8.37½
Straits Tin	32.90

CHICAGO IRON MARKET, DECEMBER 16.

Lake Superior Charcoal	$19.50-$20.00
Southern, No. 2 Foundry	18.35- 18.85
Northern, No. 2 Foundry	19.00- 19.50

December 16, 1909.

Foundry Iron was the same as the week previous.
$2 more a ton than year previous.
Copper was ½ cent more a lb. than month previous.
the same price as the year previous.

CHICAGO OLD METAL MARKET.

Dealers' buying prices are as follows:

Clean heavy copper and wire	$12.50
Light copper	11.25
Heavy composition	12.00
Heavy yellow brass	12.00
Light brass	9.00
Heavy lead	4.00
Tea lead	3.60
Block tin pipe	28.00

NEW YORK OLD METAL MARKET.

New York.—Dealers' buying prices are as follows:

Heavy crucibled copper	$12.37½ to	$12.62½
Light copper	10.81½	11.12½
Plumbers' cocks and faucets	9.50	9.75
Heavy lead	4.25	4.30
Tea lead	4.00	4.10
Heavy lead		3.90
Solder joints	6.50	6.75
Mixed pewter		21.00

Not Like the Stage.

"She spurns my suit."

"Oh, you're bound to get the girl in the end."

"I'm afraid not. Life ain't no melodrama."

PERSONAL MENTION

L. G. McCrum, president of the McCrum-Howell Company, of New York City, Norwich, Conn., and Uniontown, Pa., was in Chicago this week.

John A. Peters, general manager of the Abingdon Seat and Tank Manufacturing Co., of Abingdon, Ill., was in Chicago in the early part of the week.

E. F. Glore, president of the Glore Supply Company, of Philadelphia, was in Chicago this week and favored some of his many friends in the trade with a call.

E. W. Linforth, of French & Linforth, manufacturers' agents at San Francisco, Cal., was in Chicago this week on his way home from his annual trip to the East.

Herbert T. Sherriff has been appointed Pacific Coast representative for the Nye Tool & Machine Works, of Chicago. He will make his headquarters at San Francisco.

Theodore Ahrens and E. L. Dawes, president and manager of factories, respectively, of the Standard Sanitary Manufacturing Company, of Pittsburgh, Pa., were in Chicago this week and called on some of their many friends in the trade.

ASSOCIATION NEWS

HUDSON COUNTY PLUMBERS ORGANIZE.

Guttenberg, N. J.—The members of the plumbing trade in this vicinity have organized an association to be known as the Hudson County Plumbers' Protective Association. Membership can be obtained by anyone engaged in the business anywhere in the county. At present the membership, which numbers twenty-four, includes master plumbers in West New York, North Bergen, Weehawken and Guttenberg. President George B. Barrett says the organization is growing rapidly. The officers are George B. Barrett, of Guttenberg, president; George Yehlen, West New York, vice-president; Edward Murphy, North Bergen, secretary and treasurer. A notable feature of the new association's policy is this, that no dues are imposed upon the members. Special assessments only are made from time to time for the bare expenses of the administration. The association will later apply for membership in the National.

NEWARK MASTER FITTERS' ANNUAL BANQUET.

Newark, N. J.—Good fellowship reigned supreme at the annual banquet of the Master Steam and Hot Water Fitters' Association of this city, the fifth occasion of its kind, and almost every member of the association together with many of their supply friends gathered to make it a success. It was held on Wednesday evening, December 8, at Davis' parlors, 943 Broad street. A Troubadour Quartette was on hand to furnish music, with several vocal selections and violin solos.

The dinner was scheduled for 6:30 p. m., but it was an hour later when President Walter A. Lawson led

the march to the banquet hall where a bounteous feast was spread. When seats were taken, National Vice-President Edward B. Denny in a few well-chosen remarks extended a hearty welcome to those present. This comprised the entire program of speechmaking of the evening. At these annual meetings the Newark steam fitters do not believe in talking shop, which naturally would creep into the speechmaking, and instead, when cigars were lighted, a variety of entertainers kept the attention of their guests for several hours.

A delegation of members of the Asbury Park Association journeyed up from that city to join in the festivities. This was composed of John Reed, Andrew Van Cleve, Joel Boyce, George Turner and F. Brown. There is a possibility that a similar affair will be held in their city; they are at least giving the matter serious consideration. National Secretary Henry B. Gombers was also present.

After the entertainment closed some of the party found their way to the Tuxedo Alleys, where some salesmen walloped the steamfitters, led by John Cooney, of Harrison. The Asbury Park members went through some exciting games and had to get a taxi to catch their 12:20.

Before the gathering disbanded a hearty vote of thanks was extended to Sol Berla, William Whitlock and Robert Berla, who arranged the evening's program.

NEWARK CONTRACTORS HOLD FIRST ANNUAL MEETING.

Newark, N. J.—The Associated Building Contractors of this city held their first annual banquet on Monday evening, December 13, at Krueger Auditorium. Close to three hundred members and their guests attended, and no pains were spared to make their initial attempt a standard of success to be emulated in future years. A good portion of contractors in every branch of building construction and engineering was represented at the dinner, with here and there members of the supply fraternity in each and every branch. The following master associations are affiliated in this organization: **Plumbers, Steam Fitters, Carpenters, Masons, Sheet** Metal Workers, Painters, Felt Roofers, Slate Roofers, Cement Workers, Electricians and Blue Stone Workers. The auditorium was beautifully decorated with flags and bunting, and the tables arranged in two long rows, each table seating sixteen, while at their head at a long table were seated President Chas. E. Van Syckle and other officers of the Association, with several distinguished guests.

The dinner consisted of the most delicious viands, and good music was furnished throughout the festivities by Krimke's Orchestra. A sixteen-page souvenir menu containing the names of the officers and committees, and the words of many popular songs, in which the merry party joined with the music, and a handsome medallion watch fob with a bas relief of Abraham Lincoln were distributed. When coffee was served President Van Syckle welcomed the guests and introduced the Rev. Dr. MacDonald who kept the attention of his audience for some twenty minutes with humor and some good advice, and received hearty applause. James E. Degnan, secretary for Senator Smith, spoke of the nation's progress. Auld Lang Syne was sung at eleven o'clock, and with applause the gathering disbanded. Enos H. Harrison was chairman of the arrangements committee, and was assisted by Jacob Stuven, W. W. Schouler, Samuel Blair and A. W. Sanford.

CONVENTION DATES.

January 18, 19 and 20, 1910.—Sixteenth annual meeting of the **American Society of Heating and Ventilating Engineers,** in New York City. The sessions will be held in Engineering Societies building, 29 West 39th street.

January 20, 21 and 22, 1910.—Fifth annual meeting of the **American Society of Inspectors of Plumbing and Sanitary Engineers,** at Trenton, N. J.

January 26 and 27, 1910.—Annual convention of the **Illinois Master Plumbers' Association,** at Springfield, Ill. Headquarters at the Annex of the St. Nicholas Hotel.

March 7 and 8, 1910.—Annual convention of the **Kansas State Association of Master Plumbers,** at Kansas City, Kans. Headquarters at the Grund Hotel.

March 8 and 9, 1910.—Annual convention of **New York State Association of Master Plumbers,** in New York City.

PUBLIC COMFORT STATIONS

TO RUSH WORK ON PUBLIC COMFORT STATION.

Indianapolis, Ind.—The Board of Public Works has this week adopted the plans and specifications prepared by Foltz & Parker, architects, for the public comfort station which is to be constructed underground at Kentucky avenue and Washington street, and the contract probably will be let December 24. It is expected that constructive work on the station will be begun immediately afterward, and an effort will be made to complete it as soon as possible. A space 78x22 feet will be occupied by the roof of the station, which will project two feet above the pavement. There will be two general compartments, each with an individual opening from the street. Surmounting the center of the roof will be an ornamental kiosk of artistic design bearing a large art glass lamp. The top of this lamp will be twenty feet above the pavement. The roof will be surrounded by a stone parapet and will be constructed of reinforced concrete. The ornamental kiosk will probably be of bronze. The interior of this station will be of tile, with the exception of the terazza floor. The woodwork will be mahogany and other interior work will be of marble. Foltz & Parker, who have designed the station, have had similar contracts in other cities and are embracing in the station here many of the points of design and construction that have been found practicable elsewhere. It is probable that the cost of the construction will fall under the $20,000 appropriation which was made for the purpose. Mayor Bookwalter, whose administration closes with the end of this month, is to be congratulated on the excellent work he has done in connection with this public enterprise.

A New Laundry Stove

"Just what I wanted" says the housewife. And the wonder is it was not thought of long before. A new Laundry Stove with the top made of four pieces, bolted together, allowing for sudden expansion and contraction without cracking — and a front coal feed. All provided in our No. 1-D Laundry Heater.

"No. 1-D Ideal" Laundry Heater

One more improvement which marks IDEAL Boilers and AMERICAN Radiators as a product of skillful and progressive manufacture which not alone keeps in step with the times, but constantly anticipates and supplies the needs of the consumer.

AMERICAN & IDEAL RADIATORS BOILERS

A Heating Outfit is More Efficient with NORWALL and SYLPHON SPECIALTIES

AMERICAN RADIATOR COMPANY

General Offices, 282-286 Michigan Ave., Chicago.

New York	Cincinnati	Cleveland	Atlanta	Brantford, Ont.	Denver
Philadelphia	Boston	Milwaukee	Minneapolis	Seattle	St. Louis
Pittsburg	Buffalo	Indianapolis	Kansas City	Omaha	San Francisco
Washington					

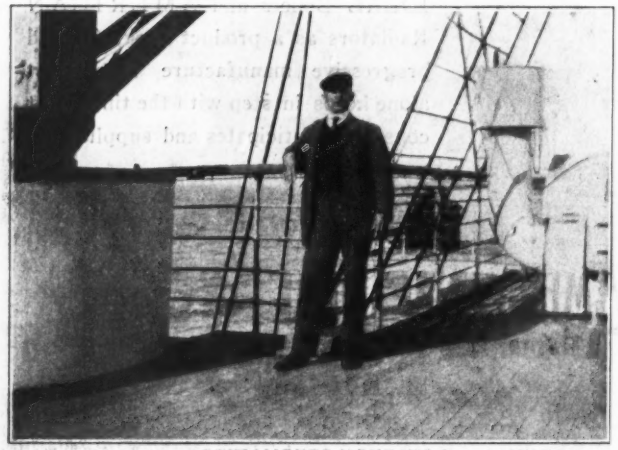
GOVERNMENT WORK

Washington, D. C.—Sealed proposals will be received at the office of Supervising Architect James Knox Taylor, until 3 o'clock p. m., January 11, 1910, for the extension, remodeling, etc. (including plumbing, gas piping, heating apparatus, electric conduits and wiring), of the U. S. post office at Chester, Pa., in accordance with the drawings and specifications.

Washington, D. C.—Sealed proposals will be received at the office of Supervising Architect James Knox Taylor, until 3 o'clock p. m., on January 19, 1910, for the construction (including plumbing, gas piping, heating apparatus, electric conduits and wiring), of an extension, remodeling, etc., to the United States Post Office and Court House at La Crosse, Wis., in accordance with drawings and specifications.

Washington, D. C.—Sealed proposals will be received at the office of Supervising Architect James Knox Taylor, until 3 o'clock p. m., January 17, 1910, for the construction (including plumbing, gas piping, heating apparatus, electric conduits and wiring), of the United States Post Office at Henderson, N. C., in accordance with drawings and specifications.

Washington, D. C.—Sealed proposals will be received at the office of Supervising Architect James Knox Taylor, until 3 o'clock p. m., January 14, 1910, for the extension, remodeling, etc. (including plumbing, gas piping, heating apparatus, electric conduits and wiring), of the United States Post Office at Emporia, Kan., in accordance with the drawings and specifications.



Alfred Morris, a prosperous master plumber at Newport News, Va., on board the steamship S. S. Mauretania en route from New York to Liverpool.

North Bergen, N. J.—Edward F. Murphy, of 5171 Hudson boulevard, has the plumbing in two residences on that boulevard, two factory buildings and four residences at Twenty-third and Ridgley streets here. He also has the plumbing in a residence on Jackson street and another on Sixteenth street in West New York.

SCHOOL OF SANITARY SCIENCE AT CORNELL UNIVERSITY.

Ithaca, N. Y.—The course of lectures on sanitary science and public hygiene offered to the students of Cornell university through the co-operation of the university authorities and the New York State Department of Health, has started out the college year of 1909-10 with flying colors. The course is purely elective and is framed not so much as a technical course which will enable the student to qualify as an expert sanitarian, as one that will make the graduate able to take an intelligent and informed interest in the great questions of sanitation which are increasingly demanding and attracting public attention. The college student of today is to be a leader of public opinion in the near future; and it will mean much for the betterment of conditions among all classes in this country, if our public men know the principles upon which the comfort, safety, and health of the community and individuals depend. Among the lectures to be given in the second term are the following: "The Relation of the Engineer to Sanitation," by Prof. H. N. Ogden; "Principles of Water Purification," by Geo. C. Whipple; "Water Purification Plants," by Theodore Horton; "The Problem of Sewerage," by Prof. H. N. Ogden; "Sewage Disposal Plants," by H. B. Cleveland.

MIDDLE STATES

Rochelle, Ill.—W. J. Law has purchased the interest of his partner, Herman Gable, in the plumbing firm of Law & Gable.

CHURCH MEMBERS INSTALL PLUMBING AND HEATING SYSTEMS IN THEIR CHURCH.

Chicago, Ill.—Capitalists and laborers, union and non-union men, all working harmoniously on a plumbing, steam heating and electric wiring job, is the unusual accomplishment of the Third Congregational Church of Oak Park. The job has just been completed, after three months' work, and on Sunday, December 19, Rev. A. H. Armstrong and his congregation will be warmed by a plant put in by their own hands. Practically all the men of the church had a hand in the enterprise, and the women worked in relays, serving lunch at midnight every night the "gang" was on the job. Union plumbers, carpenters, painters and electricians took the lead. The helpers were the "capitalists," and the pastor, Rev. Mr. Armstrong, did everything that an "apprentice" could do and was praised by his comrades, capitalists and workers alike.

Proof Produced.

"The trouble with this country is that everything is new," said the Englishman, taking breakfast with an American friend at a Sixth avenue restaurant. "There is absolutely nothing old in this country."

A sudden spasm seemed to come into the face of the foreigner, for he had just opened an egg.

"Excuse me," he continued, with his hand to his nose; "I wish to retract that statement about there being nothing old in this country."—Yonkers Statesman.

NEW YORK NEWS

Watertown, N. Y.—F. R. Phillips, successor to Phillips and Parkhurst, has removed from Arsenal street to new quarters at 170 Jackman street.

Watertown, N. Y.—The firm of Brennan & Co., composed of W. J. Brennan and C. L. Roof, is closing out its stock preparatory to winding up its affairs.

Watertown, N. Y.—E. C. McCrady, formerly of McCrady & Rogers, will continue in the plumbing and heating business on his own account as successor to the above firm.

Watertown, N. Y.—E. R. Stone, 420 Mill street, has the contract for the plumbing and heating in the new Charlevoix building on Main street, and six houses on Cross street.

Watertown, N. Y.—Geo. B. Worlock has the contracts for the plumbing and hot air heating in a new two-family house at 63 Stone street for Fred Porter; also one for Jos. Nellis.

Watertown, N. Y.—G. H. Mowe, successor to Mowe, Nichols & Parkhurst, is doing the plumbing and steam heating in a new school at Copenhagen, N. Y., and the heating in one at Brownsville, N. Y.

Schenectady, N. Y.—The plumbing and heating firm of Hillman & Dibble, formerly of 530 Liberty street, has been succeeded by A. T. Hillman & Co., who occupy attractive new quarters at 738 State street.

Syracuse, N. Y.—Lavier & Russell is the new firm in the plumbing and heating business at 333 East Water street. They have the contract for the installation of a fan system of heating in the city truant school.

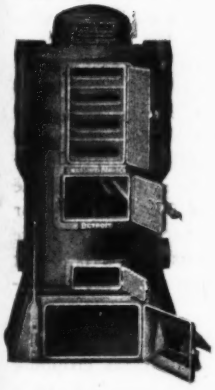
Watertown, N. Y.—The firm of Healy & Chambers, which has been engaged in the plumbing and heating business for the past seven years, is liquidating its business and closing out its stock. Mr. Chambers will go to Denver, Col., and Mr. Healy to Southern California to engage in the same line of business.

Schenectady, N. Y.—Wm. H. Zeigler has erected a handsome new three-story building at 1434 State street. His plumbing and heating business is located on the street floor in a commodious store. He is at present engaged with the plumbing and steam heating in a new M. E. Church at Mt. Pleasant, N. Y.; store and apartment buildings for J. H. Turko, on Central avenue, Albany, and for Joseph Shreck, on Albany street, Schenectady.

Watertown, N. Y.—H. W. Rogers, formerly of McCrady & Rogers, which firm was recently dissolved, has engaged in the plumbing and heating business with an attractive store at 505 State street. He has the contracts for the plumbing and hot air heating in a two-family house on State street, and one on Hamilton street for E. D. Lindley; also in the residence of Capt. Chas. Kendall, at Clayton, N. Y. He would be pleased to receive catalogs from manufacturers and jobbers of plumbing and heating goods.

CAPITOL BOILERS AND RADIATORS

The Capitol Solar Burns Any Fuel



Any fuel can be used in Capitol Solar Boilers. Originally designed for hard coal, but used succesfully with soft coal—any grade—coke, wood or gas. Fire-pot is large and deep enough to carry a deep fire for maximum length of time. The grates have air spaces suitable for the fine or largest coal and they rock and dump so as to allow minimum space between bars when tilted at any angle.

You cannot find a boiler better adapted for your residence work. 19 sizes—steam and hot water.

Catalogue and description on request.

United States Heater Company.

General Offices and Works: Fort St. and Campbell Ave., DETROIT, MICH.

BRANCHES:

NEW YORK	129 Worth St.
CHICAGO	34 Dearborn St.
OMAHA	916 Farnam St.
DETROIT	139 Jefferson Ave.
KANSAS CITY OFFICE	1020 Commerce Bldg.

SALES AGENCIES:

MINNEAPOLIS, MINN.,	Plumbing & S. F. Supplies Co.
ST. LOUIS, MO.,	L. M. Rumsey Manufacturing Co.
DENVER, COLO.,	Kellogg & Stokes Stove Co.
DULUTH, MINN.,	Duluth Plumbing Supplies Co.

SOUTHERN NOTES

Weston, W. Va.—Perry & Bishop have recently opened a plumbing shop in this town.

Winchester, Ky.—Vivian & Eades have opened a plumbing establishment at 41 East Broadway.

Lexington, Ky.—McElhone & Mahoney are installing one hundred new lavatories in the Phoenix hotel.

Parsons, W. Va.—The Corrick Hardware Company is engaged in overhauling and remodelling the plumbing in the Tucker county court house.

Lexington, Ky.—J. J. Fitzgerald has started work on the $6,000 plumbing and heating contract in the new Federal court building and postoffice at Versailles, Ky.

Frankfort, Ky.—Mr. Thompson, of the Frankfort Plumbing Company, has bought his partner's interest in the firm and is now sole owner. The firm name will remain the same.

Fairmont, W. Va.—The South Side Plumbing Company has recently secured the contract for the installation of a modern plumbing system in the residence of Dr. J. A. Graham.

Georgetown, Ky.—E. F. Gray has a number of good residence jobs under way at present. He will start work on the plumbing in R. L. Garearson's new residence about January 3, 1910.

Ashland, Ky.—W. M. Nicholson, of 213 Seventeenth street, has several residence plumbing jobs under way and will start work on the plumbing in J. Whittig's new residence in the near future.

Wilmington, Del.—Herman E. Hauf, of 323 East Fourth street, has secured the contract for installing plumbing systems in four apartment houses in Brooklyn, N. Y. The consideration amounts to $17,000.

Fairmont, W. Va.—Among the contracts recently awarded to the Reed Plumbing Company is the plumbing in C. Miller's new residence and plumbing and hot water heating in S. R. Nuzman's residence.

Cynthanna, Ky.—H. Mullen has contracted for the plumbing and hot water heating for the new Farmers' National bank. Mr. Mullen's work will run about $2,500, and is to be started about January 10, 1910.

Louisville, Ky.—Joseph Baron, the East End plumber and beer pump doctor, has recently taken out a permit for a $14,000 apartment house which he will erect at the corner of Castlewood drive and DeBarr street.

Fairmont, W. Va.—The Fairmont Plumbing Company recently received the $3,000 plumbing and heating contract for the J. G. McCrory Company's new building. The work will be started within the next few days.

Lexington, Ky.—The Ahern Plumbing Company has secured the contract for plumbing, heating and gas fitting in the new postoffice at Paris, Ky. The consideration is $4,400. The pipe work will be started about January 1, 1910.

Louisville, Ky.—M. F. Morris, of 973 Baxter avenue, has contracted for the installation of a complete system of sanitary plumbing in the new residence being erected by Eliza E. Walch. The contract calls for the completion of the work by February 15, 1910.

Louisville, Ky.—Jacob Meyer will start work on the $1,500 plumbing and heating contract in the Highland police station house about January 1. He has a number of new residence jobs to start at about the same date, among which are those of Mrs. R. H. Barker and Geo. Aufenkamp.

THE GREAT NORTHWEST

Minocqua, Wis.—Smith & Krupp have opened a plumbing establishment in the Fisher building.

Tacoma, Wash.—A. W. Kintz has purchased the store building and property at 1308 Center street. It is his intention to move his plumbing establishment from 1902 S. D street, to the new location.

Grand Forks, N. Dak.—The Dakota Plumbing and Heating Company has secured the contract for the plumbing and heating in the new Schlaberg building on De Mers avenue. The contract amounts to $4,000.

Waupun, Wis.—F. E. Grebe has been awarded the contract for plumbing the new county jail and the sheriff's residence for Vernon county at Viroqua, Wis. Mr. Grebe is now completing work on a large contract at Horicon, Wis., where he is installing the plumbing in the new office building of the Van Brunt Mfg. Company.

SAN FRANCISCO

RAINY SEASON HINDERS PLUMBING WORK IN SAN FRANCISCO.

San Francisco, Cal.—Building operations have been sadly interfered with in this city during the past week on account of a storm of unusual severity and there has been but little work in the plumbing line done except in a few buildings, which are enclosed. Plans had been made for doing a large amount of work during the winter months but the rainy season has set in early and storms have been of unusual severity, so that operations have been hindered to a marked degree. But few contracts are being let at the present time, but from the number of plans that are being drawn it is anticipated that the spring season will be an especially active one. Architects are very busy and some of the work on hand is of large size. But few buildings for office purposes are now being constructed, but a large amount of hotel and apartment house work is being planned and this is of even more interest to the plumbing trade.

TO ELIMINATE SUB-CONTRACTING EVIL.

San Francisco, Cal.—There are indications cropping out here that the local plumbing trade is at last ready to take action on certain measures that will mean a great deal for the betterment of the plumbing business and insure a larger margin of profit to master plumbers than has been the rule of late. The most important question under discussion at the present time is the sub-contracting question, and if all goes as planned, it is anticipated that one of the greatest evils of the plumbing trade will shortly be eliminated from the local field by an agreement of the master plumbers

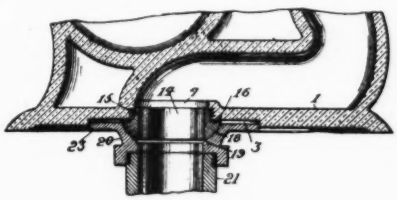
not to accept sub-contracts from general contractors but to insist on doing business directly with owners, thus protecting themselves in a financial way and making it possible for the owner to secure better service. It is anticipated that this change in policy will meet with the general approval of almost all the parties concerned, with the possible exception of the general contractor, who, doubtless, has been making considerable money out of the sub-letting of this branch of the building business. While there will probably be some confusion incident with the change of business policy proposed, owing to contracts now on hand and contracts that are being figured on, there is no great difficulty anticipated in putting the new policy into effect.

PATENTS

941,997. Device for Flushing Basins. Edmond Kuhn, East Orange, N. J., assignor, by direct and mesne assignments, to Kuhn Specialties Company, East Orange, N. J., a corporation of New Jersey.

941,999. Molding Machine. Wilfred Lewis, Philadelphia, Pa., assignor to The Tabor Manufacturing Company, Camden, N. J., a corporation of New Jersey.

942,547. Sanitary Ware. Joseph J. Cosgrove, Scranton, Pa., assignor to Standard Sanitary Manufacturing Company, Pittsburg, Pa., a corporation of New Jersey. The three claims made for this invention read as follows: 1. A water-closet of vitreous sanitary ware having an integral screw-thread formed on the inner wall of its outlet passage. 2. A water-closet of vitreous sanitary ware having an integral screw-thread formed on the inner wall of its outlet passage and a metallic thimble screwed into said outlet passage. 3. A water-closet of vitreous material having an outlet passage with an integral molded screw-thread formed thereon, in combination with a screw-threaded metallic thimble engaging the screw-thread on the outlet passage.



942,045. Valve. Frank M. Ashley, Brooklyn, N. Y.

942,047. Hose or Pipe Coupling. Charles E. Atkinson, Richmond, Ind.

942,112, Gas-Pressure Regulator. Orville Sprecher, Milwaukee, Wis.

942,158. Safety Gas-Valve. Forrest Yockey and Charles D. McLeod, Sioux City, Iowa.

942,200. Pipe and Rod Threader. Henry Gautshi, Toledo, Ohio.

942,246. Valve for Steam-Traps. Benton L. Clover and Griffith H. Clover, Chicago, Ill.

942,360. Regulating-Valve. Thomas M.Wilkins, East Randolph, N. Y., assignor to Charles S. Grover, Jamestown, N. Y.

942,339. Soil-Pipe Fitting. Fred B. Morton, Pasadena, Cal.

942,385 and 942,386. Lavatory Fitting. Philip Mueller, Decatur, Ill., assignor to H. Mueller Manufacturing Company, Decatur, Ill., a corporation of Illinois.

942,405. Non Scalding Shower-Bath Cock. Daniel W. McNeil, Cincinnati, Ohio, assignor to the John Douglas Company, Cincinnati, Ohio, a corporation of Ohio.

942,457. Molding-Machine. Samuel F. Nicolai, Jackson, Mich.

942,464. Water Closet. Horace S. Rumsey, St. Louis, Mo.

942,492. Valve. Charles F. Fernald, Boston, Mass., assignor to Star Brass Manufacturing Company, Boston, Mass., a corporation of Massachusetts.

942,541. Sillcock and Other Valve. Frank W. Carlson, Chicago, Ill.

942,576. Valve. William N. Long, Eugene, Ore. Filed Jan. 14, 1909. Serial No. 472,194.

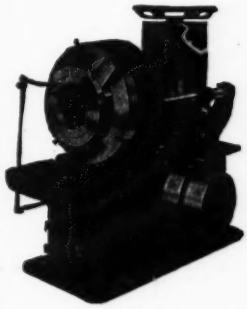
942,834. Valve. Joseph P. Lavigne, Detroit, Mich., assignor to the Lavigne Manufacturing Company, Detroit, Mich. Filed June 5, 1907. Serial No. 377,300.

942,870. Theromstat. John F. Williams, Sandusky, Ohio. Filed April 17, 1908. Serial No. 427,590.

Burlington, Iowa.—The Russell Sewage Disposal Company, of this city, furnished the nine sewage disposal systems which have been installed at as many suburban dwellings near Iowa City, Iowa. Attorney Milton Remley, in that city, is the owner of these buildings.—Adv.

All Pipe Machines Thread Pipe

But that's not the only essential in a Pipe Machine. It's the one which is built more substantially than any other; has features for saving labor and time, is adaptable to all conditions and any location, that will give the best results, and the wise purchaser will realize it is the most profitable investment.



THE LOEW VICTOR

Excels in all these points

Belt, Motor, Gas Engine
Driven ¼ to eight inches

A full description of the **LOEW VICTOR** will prove of interest to everyone who has pipe to cut and thread.

The Loew Manufacturing Co.
CLEVELAND, OHIO

CLASSIFIED ADVERTISEMENTS

The rate of advertising under this heading is 25 cents a line, or 5 cents a word, for an insertion, remittance to be made with order. To insure insertion in this column copy should be received not later than Wednesday morning.

Help Wanted.

WANTED—Two experienced traveling salesmen for central and southern territory by large house handling full line of plumbers', steam and mill supplies. Address 186, "Domestic Engineering," Chicago.

WANTED—First-class representative by a large manufacturer of boilers and radiators, for the State of Ohio. Thorough experience in the heating business, both as engineer and salesman, required, also a person acquaintance with the trade in the locality mentioned. State experience, present employment, references and salary desired. Address No. 174, "Domestic Engineering," Chicago.

Situations Wanted.

EXPERIENCED heating and plumbing supply office man desires responsible position. Now with New York house. Address No. 187, "Domestic Engineering," Chicago.

A YOUNG MAN with 12 years' practical experience at plumbing and steamfitting, and for the past 5 years Chief Plumbing Inspector of a large city, would like a position with a supply house, where there is a chance for advancement or to go on road. Best of references. No. 185, "Domestic Engineering," Chicago.

Plumbing Schools.

LEARN PLUMBING on new buildings in four months. Tools furnished. Master Plumbers' Trade School, 3659 Finney Ave., St. Louis, Mo.

BOOKS.

"Domestic Engineering" Directory. Published annually in three parts; part I contains directories of great value to the jobber, manufacturer, and dealer in plumbing, heating and mill supply trades; bound in leather, $5.00; part II is illustrative and descriptive of the mentioned trades' specialties; 11¼x8 inches; bound in cloth; part III is in Spanish. "Domestic Engineering," Chicago.

Sanitary Sewerage of Buildings. By Thos. S. Ainge. An authoritative statement of the principles and practice of sewering buildings, including the design and construction of plumbing systems, disposal of sewage in unsewered localites, etc.; 8x5 inches; bound in cloth; 209 pp.; postpaid, $1.50. "Domestic Engineering," Chicago.

Plumbing Catechism. By Charles B. Ball. Second edition. This book formulates, in question and answer form, the basic principles of plumbing design and practice. It is therefore especially commended to students in engineering and trade schools, and to master and journeymen plumbers, preparing for examinations. Bound in cloth; 6¾x4¾ inches; 100 pp.; postpaid, $1.00. "Domestic Engineering," Chicago.

Salesmen's List of Jobbers of Plumbing Supplies. Bound in cloth; pocket size. Sent postpaid for one dollar. "Domestic Engineering," Chicago.

Sanitation in the Modern Home. By Jno. K. Allen. An invaluable guide to the architect, plumber, heating engineer and house owner, telling just what is necessary to make a house completely sanitary from the subsoil to the roof. 8x5¼ inches; 273 pp.; bound in cloth; postpaid, $2.00. "Domestic Engineering," Chicago.

Roughing-in House Drains. Edited by Jno. K. Allen. A complete guide to the work of roughing-in plumbing, from the digging of the sewer to the finishing length of the soil and vent stacks, giving each step to be taken and telling how and why it is done. 6¼x4¼ inches; 184 pp.; bound in boards. Postpaid, 50 cents. "Domestic Engineering," Chicago.

Notes on Heating and Ventilation. Second edition. By Prof. John R. Allen. Written primarily for the steamfitter and designer of heating systems. Reduced to as brief a form as possible, so that readers can readily find notes or data desired. Bound in cloth, 6¾x4¾ inches; 272 pp.; postpaid, $2.00. "Domestic Engineering," Chicago.

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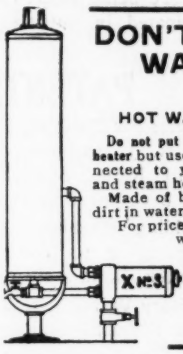
Dean's Steamfitter's Computation Book. Contains figured cubical contents of rooms of different sizes and ceiling heights; also tables showing radiation necessary at various rates per square foot of glass surface, wall surface, or cubic feet; also square feet of glass or wall in surfaces of various dimensions; also cost of selling price of radiators at various market prices. These tables save fitters thousands of arithmetical calculations, giving the answers ready to hand. Leather bound; 7¾x5 inches; 90 pp.; postage prepaid, $2.50. "Domestic Engineering," Chicago.

Dean's System of Greenhouse Heating by Steam or Hot Water. Directions for obtaining different temperatures; tables of radiation necessary per square foot of glass; tables giving glass surface; sizes of flow and return pipes; explanations so simple all fitters may understand. Cloth bound, 7¾x5⅛ inches; 246 pp.; postage prepaid, $2.00. "Domestic Engineering," Chicago.

Tables for Calculating Sizes of Steam Pipes. By Isaac Chaimovitsh. These tables furnish a method of determining sizes of steam pipes for low pressure heating without laborious mathematical calculations; bound in cloth; 4½x6⅝ in.; 47 pp.; postpaid, $2.00. "Domestic Engineering," Chicago.

Swimming Pools. By. Jno. K. Allen. Their construction; cold and hot water supply; various methods of heating the water; directions as to selecting correct sizes of heaters. A practical guide to the subject. Over thirty illustrations; 6½x4¾ inches. Postpaid, 50 cents. "Domestic Engineering," Chicago.



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HOT WATER FREE

Do not put a coil in your steam heater but use an X Heater connected to your range boiler and steam heating plant.

Made of brass, no rust, no dirt in water.

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